DOCUMENT RESUME

ED 140 850 IR 004 970

AUTHOR	Wax, David M.; Vaughan, Patricia E.
TITLE	Northeast Academic Science Information Center (NASIC). Final Report.
INSTITUTION	New England Board of Higher Education, Wellesley, Mass. Northeast Academic Science Information Center.
SPONS AGENCY	National Science Foundation, Washington, D.C.
PUB DATE	76
GRANT	SIS-7308366, GN-37296
NOTE	117p.
EDRS PRICE	MF-$0.83 HC-$6.01 Plus Postage.
DESCRIPTORS	*Bibliographies; Computer Oriented Programs; *Educational Programs; *Information Centers; Information Services; Instructional Materials; *Library Technical Processes; Machine Translation; *Material Development; *Program Development; Summative Evaluation; University Libraries
IDENTIFIERS	*Northeast Academic Science Information Center

ABSTRACT

The Northeast Academic Science Information Center (NASIC) was developed to promote the increased and more effective use of machine-readable bibliographic information resources to support the information needs of the academic research community of the Northeast. NASIC was involved with the continued testing and evaluation of available computer-based information services; extensive marketing of information services to a significant portion of the academic community of the Northeast; the development of training materials and programs to enable academic libraries to provide the intellectual interface vital to the effective utilization of machine-readable information services; and the development and implementation of managerial arrangements that would allow for the maximum utilization of computer-based information services in the Northeast consistent with the continuing existence of NASIC as a self-supporting program. A prominent aspect of NASIC was its effective training program as well as the development of administrative and reference materials. (Author/DAG)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED140850

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

NORTHEAST ACADEMIC SCIENCE

INFORMATION CENTER

NASIC

FINAL REPORT
March 1973 - December 1976

by

David M. Wax

Patricia E. Vaughan

This material is based upon research supported by the National Science Foundation under Grant No. SIS-7308366, GN 37296. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the National Science Foundation.

IR004970

TABLE OF CONTENTS

INTRODUCTION		1
PRE-GRANT HISTORY		3
INITIAL PROGRAM ORGANIZATION		6
PROGRAM DEVELOPMENT		13
INITIAL DISSEMINATION		16
EXPANSION		28
CONSOLIDATION		32
TOWARD SELF-SUPPORT		55
NASIC 1976-1977		62
CONCLUSION		75
APPENDIX A:	SAMPLE PAGES EXTRACTED FROM A NASIC DATA BASE PRESENTATION	85
APPENDIX B:	SAMPLE QUICK REFERENCE CHART AND NOTES EXTRACTED FROM NASIC SEARCH AIDS	95
APPENDIX C:	LETTERS FROM NASIC INSTITUTIONS	101

LIST OF TABLES AND FIGURES

Table 1	Level of Activity Directed Toward NASIC Program Expansion	30
Figure 1	Institutions Participating In NASIC Program (June 1976)	43
Figure 2	List of Publications	46
Table 2	NASIC Usage Summary-1	48
Table 3	NASIC Usage Summary-2	49
Table 4	NASIC Usage Summary-3	50
Figure 3	Organizations Receiving Presentations On NASIC	53
Figure 4	NASIC Affiliates - April 1977	64

INTRODUCTION

The Northeast Academic Science Information Center (NASIC) program was funded as a unique experiment in the utilization of a regional organization to develop an intermediary role in the process of providing machine-readable bibliographic search services to the academic research community. NASIC, supported by a grant from the Office of Science Information Service (now the Division of Science Information) of the National Science Foundation (NSF) to the New England Board of Higher Education (NEBHE), was developed as a managerial rather than technical effort, although technological advances constituted one of the major bases for many of the managerial decisions made.

For these reasons, this final report on the NASIC program will emphasize management and decision-making issues in its presentation of the history and evaluation of the development effort. Detailed descriptions of program activities, as previously discussed in Quarterly Progress Reports, have frequently been eliminated in favor of analytical observations made possible by hindsight. It is hoped that this type of report will be of benefit not only to the National Science Foundation but also to other organizations contemplating an intermediary role in the provision of information services and to all parties involved in the production or utilization of machine-readable bibliographic search services.

PRE-GRANT HISTORY

The idea for an activity such as that undertaken by NASIC was initiated by the Executive Committee of the New England Library Information Network (NELINET), a long-standing program of NEBHE oriented toward the improvement of academic library services through the use of computerized resources. The initial impetus for the development of a proposal for NASIC was the desire of the New England Research Applications Center (NERAC), a NASA-supported search center at the University of Connecticut, and of the small search operation at MIT to expand their programs for marketing computerized information services to users in the academic community. The original intent of the proposed new program, then, was to serve as an intermediary between these two service centers (and other such centers across the country) and the academic user, in the hope of increasing academic use of existing information resources.

The proposal, as submitted by the Board in November 1972, argued the need for an ongoing program that could make available the benefits of computer-processed information without expending resources for development of redundant processing capability and hardware. It also discussed the university library as the appropriate locus for the role of intermediary between the researcher with his need for information and the data base processor with his capability of providing such information, this role being a logical extension of the library's traditional reference function. These perceptions were shared by member

libraries of NELINET and by the Association of Research Libraries (ARL) which, along with the administrations of several major universities in the region, supported the submission of the NASIC proposal to the National Science Foundation.

The major objectives of the program, as outlined in the proposal, included (1) evaluation of the technical, managerial and marketing aspects of machine-readable information services; (2) development of materials for training library staff to serve as intermediaries between the user and the machine-readable information resources; (3) delineation of the issues involved in initiating computer-based information services within university libraries and development of materials to aid administrators in facing these issues; and (4) determination of the utility and means of maintaining an ongoing, self-supporting intermediary organization, such as NASIC, to continue to provide useful services to both end users and information resource centers. In briefer terms, one might describe the objectives as the evaluation of the need for an intermediary and the accompanying definition of its role, the demonstration of effective performance in that role, and the determination of the capability of such an intermediary organization to support itself after the expiration of grant funding.

The proposed development work was to be accomplished and directed by a professional staff team assembled for that purpose by NEBHE. Additional technical work was to be performed, under contract to NEBHE, by personnel of the Technical Information Program (TIP) of the MIT Libraries and the Office of University

Library Management Studies of ARL. This staff was to be supplemented by consultants in the fields of information systems and library technology, and would receive advisory assistance from prominent academicians and research professionals. In March 1973 a grant of $355,500 was awarded to NEBHE by the National Science Foundation for the first twelve months of development of the NASIC program, through February 1974.

INITIAL PROGRAM ORGANIZATION

The initial organization of the NASIC activity and the early decisions related to staffing and contract negotiation were the major determinants of the kinds of services NASIC would develop. After fewer than nine months of program operation, NASIC had modified its proposed plan of work and had evolved into the organization that exists as the NSF funding expires.

Early in the first year it became clear that there was no pressing need for NASIC to work toward development of a machine-readable bibliographic information processing capability within the region. Existing off-line processing centers across the country indicated their willingness to provide service to academic users in the Northeast at a level that far exceeded any estimates of short run demand. For this reason, the first decision made by the NASIC administration was to postpone planned efforts directed toward evaluation of software for possible importation.

The MIT contract with NEBHE, through which the software evaluation was to be undertaken, was redirected toward the early establishment of an experimental service operation, both to establish NASIC's identity in the region as a developmental rather than a research program and to obtain as much experience with alternative models of service delivery as early as possible. At the same time, the dissolution of the Technical Information Program of the MIT Libraries led to a decision by NEBHE to contract for the services of the MIT Libraries and the Electronic Systems Laboratory (ESL), the latter being an organization that

had extensive experience related to the provision of computer-based information services.

The decision not to become involved in the direct provision of search services ("tape-spinning") led to reinforcement of the perception of NASIC as a broker between existing service centers and the academic research community of the Northeast. Initial staffing decisions, reflecting this perception, emphasized the anticipated marketing activity associated with the role of broker. In addition to the contract with MIT, the program negotiated two other small contracts related to the role of the broker, one to develop criteria for evaluating systems and software from the user's - and therefore broker's - perspective, and the other to conduct an initial survey of the market for computer-based bibliographic and U.S. Census information services. (See *Phase I Report* in Figure 2.)

The process of making these early decisions, as well as most of the other significant decisions during the life of the program, was aided substantially by the members of the advisory groups established for the program by NEBHE. Initially, there were two groups: an Advisory Board to advise the Executive Director of NEBHE on matters of policy, and a Technical Council to assist the NASIC Director in technical and administrative matters. By the second year of the program, the two groups had been merged into a single Advisory Board with a broad range of perspectives and expertise valuable to the NASIC Director and the Executive Director of NEBHE in analyzing policy issues and recommending alternative solutions. The Advisory Board, meeting

quarterly, was able to maintain a detailed understanding of developments in the program and in the general environment of information resources and thus was able to make a major contribution to the success of NASIC.

The single most important factor in the NASIC development activity during the first year was the appearance and expansion of commercially available on-line bibliographic search services. While this is not the place to argue the merits of on-line versus off-line bibliographic searching, it is important to point out that libraries and information users perceived on-line services as a step forward for reasons of speed, lower charges for multi-year retrospective searching and for the ability to define search strategy quickly and effectively through direct interaction with the data bases.

From the point of view of NASIC, or any other potential intermediary organization, there were three other aspects of the commercial availability of on-line search services that were likely to have significant impact on program organization and activities. First, the commercial vendors had become the simplest and most direct means of obtaining machine-readable search services; direct on-line access obviated the need for an intermediary if merely the absence of access to such services had been the obstacle to earlier use of these services. Second, the availability of on-line services made the batch search services, accessible through NASIC, far less appealing. Third, and most important, the marketing philosophy of each of the two major commercial vendors, whereby all users are charged the same

price for the same services, precluded any volume discounts. Also, the absence of any subscription fees or minimum monthly usage levels undermined the very concept of brokerage of on-line search services. While there might be useful functions for an intermediary to perform, there were no apparent means by which the broker could recover its costs and thus be self-sustaining. The NASIC staff determined very early in the life of the program that on-line services represented the future direction of machine-readable bibliographic information services. The first response to this trend was the decision by the staffs of NASIC, the Electronic Systems Laboratory and the MIT Libraries to modify the plans for development of the experimental NASIC service in the MIT Libraries to include on-line search services as well as batch services. The second response was to reconsider the plan for NASIC development, with the objective of defining the role of an intermediary in this new environment.

Actually, the process of providing users with bibliographic information regarding research reported by another person is a complicated one involving a large number of intermediaries. These range on the production side from the referee to the journal editor and publisher to the abstracting and indexing service. On the consumption side, there is the search service vendor, the library that provides local access to bibliographic search services and the librarian who serves as an interface between the user with a need for information and the search service with its access to the appropriate information resources. Consistent with the original NASIC proposal to NSF, the logical

locus for an organization such as NASIC on this continuum of intermediaries was on the consumption side between the librarian and library and the search service vendor. It was here that the program could fulfill its goal of facilitating effective access to computerized bibliographic information resources for the academic research community.

Discussions initiated by the NASIC staff with university librarians and with representatives of the search service vendors led to a determination that there was a range of "value added" services that NASIC could undertake to the benefit of both groups. Included in these services were training of search intermediaries, consultation with library administrators on the initiation and management of local search service operations, assistance in the education of end users regarding the existence and utility of computer-based search services, and negotiation with search service vendors as a representative of the interests of the academic user community.

Defining these proposed functions as the basis for NASIC activities, the Director made several decisions relating to the immediate future of the program. The first was to modify the staff capabilities, diminishing the prior concern with marketing of information services in favor of an emphasis on capability to train library staff and educate end users. A second decision, based on the findings of the initial market study, was to de-emphasize U.S. Census services in recognition of the high cost of providing such services and of the existence of both commercial and university-based suppliers willing to provide these

services directly to users in the academic communities of the region.

A third and very important decision was that of postponing serious consideration of issues relating to self-support after the expiration of NSF funding. This is not to imply that any decisions were made without taking into account the anticipated impact of the decision on the ultimate viability of the program. And it certainly does not indicate that a decision was made that there would be no post-grant NASIC and that, therefore, financial implications of decisions were of no import. But this decision did mean that NASIC staff recognized that the essential problems were (1) to define a role for an intermediary organization, given the new environment in which the program had to function, and (2) to demonstrate that this role could be effectively performed by the program staff and that the community for which the program was to be developed would accept this role and utilize the services offered by NASIC.

These decisions did not constitute a modification of the goals of the program proposed by NEBHE to the National Science Foundation. Instead, they were viewed as a reformulation of the means by which NASIC planned to contribute toward the effective utilization of computer-based bibliographic information services in the academic community of the Northeast. The primary objectives remained, in essence, the increased utilization of existing information resources to serve the region's academic community, the extension of the university library's traditional reference function to include the role of interface between the user and

the processing system, and the implementation of administrative and organizational arrangements to provide the NASIC user community with expanded, more convenient and hopefully less expensive machine-readable bibliographic services.

The decision-making process during the first nine months of NASIC development was not as neat or well-defined as the above description implies. In retrospect, however, it is clear that the decisions that were made delineated the program quite clearly, to the extent that the tasks of all of the second and most of the third year of operation were defined, feasible and manageable, even with the substantial reduction (in excess of $200,000) in NSF support for the second and third years of program development.

PROGRAM DEVELOPMENT

Efforts related to NASIC program development were being undertaken even as the decisions regarding program formulation were pending. NASIC was fortunate to have access to the experience and expertise of the staffs of the MIT Libraries and Electronic Systems Laboratory through the NEBHE/MIT contract. Under this contract, the MIT personnel implemented an experimental service capability in the MIT Libraries by the third quarter of program development. This experiment served three primary functions: (1) it demonstrated to the institutions of the region the service orientation of NASIC and gave evidence that NASIC would have something real to offer them in the near future; (2) it provided a realistic model for evaluating the provision of machine-readable bibliographic information services by means of an intermediary between a university library and an existing information processing center; and (3) it provided for the NASIC program a definition of the tasks involved in developing a series of library-based bibliographic search centers and initial experience in undertaking these tasks.

The development phase of NASIC involved the four major tasks indicated earlier -- training, administrative consultation, user education, and vendor negotiation -- plus a fifth which might be termed "academic marketing" and which involved enlisting institutional participants. Each of these tasks included not only the stated activity but also extensive planning, staff preparation and materials development before the actual activity could commence.

For the efforts related to training, administrative consultation and user education, the ability to draw upon the expertise and time of the MIT personnel was an invaluable asset for NASIC. In the area of training, the ESL staff planned a program, developed materials and conducted the actual training for staff of the MIT Libraries to serve as search intermediaries. Somewhat later the same ESL personnel provided the initial training for the NASIC staff members, and the ESL and MIT Libraries staff carried much of the responsibility, utilizing the materials they had developed, for the first NASIC training workshop for librarians from other participating institutions. All of this work followed, of course, the developmental patterns set by NASIC.

In the area of implementation and operation of a library-based search service, the NASIC and ESL staffs developed a detailed set of guidelines which became the basis for later NASIC handbooks used in consultation with library administrators throughout the region. The NASIC staff also met with MIT personnel to establish procedures for the MIT experimental search service operation; this exposure to the range of issues involved in introducing this kind of new service and in providing initial experience in the implementation process was very useful.

In the area of user education and service promotion, the MIT Libraries experimented with a wide range of techniques and media, including service demonstrations, campus mailings, posters, campus newspaper articles and advertisements. Efforts were also made to evaluate the effectiveness of various education and promotion strategies so as to have some basis for later

recommendations to other institutions.

This is not to imply that everything undertaken during the experimental phase at MIT was a model, in the sense of being ideal. Indeed, many of the lessons learned from the MIT experience implied procedures that should be avoided and techniques that should not be replicated. But the ability to conduct a pilot test at a prestigious and important institution and to call upon expertise of the type and quality offered by both the MIT Libraries and ESL were extremely helpful in the development of the NASIC program and enabled NASIC to move into a development and dissemination effort much more quickly than would have been otherwise possible.

INITIAL DISSEMINATION

The original NASIC proposal to the Foundation had called for the establishment of a number of demonstration search service operations in universities to test the feasibility, under varying conditions, of utilizing the university library as the locus for providing computer-based bibliographic searching. As a result of the experimental service operation in the MIT Libraries during the first year of program development, NASIC entered its second year with the capability to initiate dissemination of search service activity well beyond the original number of test sites.

The results of the NASIC first-year efforts thus effectively coincided with the reality of the sudden growth of library interest in the provision of on-line search services. An intensive marketing program by the two major data base vendors and the general publicity regarding on-line searching had created an environment in which many academic libraries in the Northeast were prepared to establish local search service capability (or had already signed contracts with one or both of the major vendors) at the same time that they were contacted by the NASIC staff regarding assistance in service implementation. It was particularly important that at this juncture in the project the Executive Director of NEBHE was invited to address the annual meeting of the Association of Research Libraries on the plan and prospects for NASIC. This discussion was, we believe, quite instrumental in furthering receptivity among leading librarians to an acceptance of NASIC-type services.

As a result of this fortuitous timing, the "marketing" efforts of the NASIC staff often served as a catalyst to bring together administrators and library staff members to discuss the possibility of bibliographic search service provision, to perceive the need for a local facility, and to recognize the benefits of obtaining those services under NASIC auspices.

The NASIC plan to initiate service at a number of test sites as a basis for persuading other institutions to become interested in machine-readable bibliographic search services became less essential than originally planned. The utilization of demonstration sites did retain its relevance insofar as these initial institutions gave the NASIC staff the requisite experience in development and implementation of a training program, in provision of assistance to libraries in the administrative implementation of local searching operations, and in working with trained Information Services Librarians (ISLs) at local libraries to establish a program of user education and service promotion. But the "marketing" of these NASIC services to other institutions could not be postponed until the work at these test sites could be evaluated, since such postponement would have precluded NASIC from taking advantage of the already existing interest in on-line search services at a large number of universities.

Accordingly, the NASIC administration expanded its "academic marketing" effort even as the activities related to the test sites were just getting under way. This strategy required that NASIC evaluate and modify its techniques and services on an

ad hoc basis rather than in a more formal fashion. The primary costs involved in this approach included a postponement of data collection, a limitation on the amount and kinds of information collected, and a decrease in the time devoted to comprehensive evaluation of the implications of each decision and the results of each activity.

The benefits of this pragmatic approach, on the other hand, were substantial. NASIC as a program needed to be perceived as something more than a service at MIT. The participation of a large number of institutions assisted the NASIC staff in the "academic marketing" activity to even more universities, and served to document the value of NASIC services to affiliated institutions. Early success thus increased the possibility for later success in persuading additional institutions both to initiate bibliographic search services and to do so under NASIC auspices. This, in turn, improved NASIC's image and position vis-a-vis the vendors and constituted a broader base of institutions upon which to build an ongoing, self-supporting program after the termination of Foundation support.

Taking into account both costs and benefits, the NASIC administration opted for the ad hoc approach. But in order to implement this approach, calling for rapid expansion of the number of local service operations, the NASIC staff found it necessary to accelerate activity directed toward several of the other tasks planned for the second year of development. Included among these were "academic marketing", negotiation of working relationships with System Development Corporation (SDC) and

Lockheed Information Systems, the two primary data base vendors; development of training materials for the increasing number of data bases accessible through those vendors' systems; provision of training for a substantially larger number of librarians than originally anticipated; and development of a capability to assist participating universities in the implementation of bibliographic search services in their own libraries.

As a precursor to region-wide dissemination, it was essential that NASIC develop in-house expertise in the performance of on-line searching, in the training of others to provide search services, and in the decision-making process related to the initiation and operation of such search services. The obvious resources to develop this expertise were the staffs of the MIT Libraries and Electronic Systems Laboratory; the NASIC management therefore negotiated a second-year contract with MIT that aimed at the transfer to the NASIC staff of the knowledge and experience obtained in the first-year experiment at MIT.

The context in which this transfer process was initiated was the establishment of a search service operation -- NASIC CENTRAL -- operating directly from the NEBHE offices. The training provided to the NASIC staff by the MIT personnel thus served as a means to transfer searching skills and, at the same time, enabled the NASIC staff to determine the requirements of a training program for library staff at institutions about to affiliate with NASIC.

The establishment of NASIC CENTRAL also required the NASIC staff to go through the process of planning and implementing a

search service operation. NASIC CENTRAL became a second model for a search service operation while providing the NASIC staff with experience that would enable them to understand and anticipate the types of problems that would arise at any location offering on-line bibliographic search services. This experience, along with materials developed by MIT personnel, served as the basis for the administrative consultation later provided by the NASIC program to assist affiliating libraries in implementing their local search service operations.

An additional objective of NASIC CENTRAL was to provide a means to meet the needs for computerized search services in that part of the academic community, particularly in the Boston area, in which the potential user group is too small to warrant establishment of a search service capability in the local library. For example, in the immediate vicinity there are several small liberal arts colleges at which faculty and students have occasionally needed computerized searches, and they have been referred to NASIC CENTRAL.

Concurrent with the process of establishing NASIC CENTRAL, the staff initiated its "academic marketing" activity, that is, the effort directed toward the development of support for establishment of computerized search services in universities throughout the region under NASIC auspices. This activity, initiated through correspondence and telephone contacts with library directors and other relevant university personnel, centered around meetings on campus at which the NASIC staff presented detailed material relating to the development and use

of machine-readable bibliographic information services, the role of NASIC as an intermediary in working with universities to make these services available on campus, and a demonstration of on-line search services.

The initial aim of the "academic marketing" activity was the enlistment of several institutions in the region to serve as test sites for the initiation of bibliographic search services. In this context NASIC would act as the intermediary between the library and the search service vendors. For participation in this test NASIC selected four relatively diverse institutions including two state universities (University of New Hampshire and University of Rhode Island), one large private university (Northeastern University) and one medium-size college with a few small graduate programs (Dartmouth College). In addition, for the training component of the test period, NASIC invited representatives from two institutions, MIT and University of Pennsylvania, at which on-line search services were already available. The total group of participants provided a range of types of institutions, varying backgrounds of library staff members, different degrees of experience with machine-readable bibliographic searching, and geographic representation of the entire region.

In conjunction with the selection of test libraries, the NASIC and MIT personnel developed a plan and organization for the training of the Information Services Librarians of the participating institutions. Since the ISL must relate the user's need for information to the many data bases available

from the various vendors, the training program had to include an introduction to the fundamental concepts of computerized searching, instruction and on-line practice in the specific systems providing access to the data bases, and provision of detailed information on the coverage and characteristics of the available data bases and the most effective techniques for searching them.

The development of the required materials and the preparation of presentations for the actual training sessions represented a major task which, in September 1974, the time set for the training of the test library staffs, was beyond the capabilities of the NASIC staff. While the vendors provided NASIC with materials and presentations related to their systems, it was decided that major responsibility for the background and data base-related materials should be assigned to the ESL and Library personnel at MIT. The data base presentations constituted a particularly significant undertaking since they required considerable research effort to document the coverage, indexing philosophy, vocabulary structure, and other components of the various data bases.

Thus, while the MIT personnel developed these training materials, the NASIC management produced a series of guidelines for the implementation of search services in the test libraries, based on the experiences at MIT and NASIC CENTRAL and on materials created earlier by the ESL staff. This work resulted in the production of a *Guide to the Implementation of NASIC Services*. Review of this document served as the agenda for meetings held at each of the test institutions, during which the

NASIC Director worked with the library directors and their staffs on the development of local plans and procedures for the provision of search services. These meetings proved to be quite helpful to library directors in that they enabled each library to benefit from the experience of other libraries and from that of the NASIC staff. As a result, potentially difficult problems, such as equipment acquisition and determination of pricing policies, could be isolated before they had a negative or delaying impact on service initiation. Of equal or greater benefit was the distribution of model forms for service provision, precluding the need for each institution to develop its own materials for the initiation of this new library service.

The final component of the initial dissemination or test phase of NASIC development was the negotiation of agreements with the two primary service vendors, SDC and Lockheed. In general, these agreements provided NASIC with assistance in its training activity both through free computer connect time and suppliers' training staff time. For marketing and user education activities, the suppliers provided additional free computer time. While the monetary value of these considerations was limited, they did enable NASIC to provide to its affiliates more effective training and service and thus improve the likelihood of more widespread participation in the program.

The training portion of the test program involved both workshops at the NEBHE offices in Wellesley and follow-up sessions at the local campuses. The workshop agenda included an overview of computerized bibliographic searching and its

relationship to traditional reference services, an introduction to the techniques and procedures for searching on the SDC ORBIT system, and detailed presentations on eight science and social science data bases, emphasizing similarities and differences between the printed and computerized versions of each data base. The eight data bases were CA-CONDENSATES, CAIN, COMPENDEX, ERIC, GEOREF, INFORM, NTIS, and SCISEARCH. Substantial computer connect time was provided for each participant to allow for practice with the protocols, commands and responses of the ORBIT system and to develop expertise in using the several computerized data bases. During these practice sessions, staff from SDC, MIT and NASIC served as resource persons to answer questions at the terminal.

After the workshop sessions, the NASIC Information Services Librarian visited the four new test institutions for at least two days each, to provide the Information Services Librarians with additional instruction and supervised practice as well as to assist in demonstrations of the search service capability to faculty, library staff and students on campus.

All of the activities described in this section occurred during the period from March through September 1974, months 13 through 19 of NASIC program development. As indicated previously, this early move into initial dissemination was made necessary by the realities of the search service market, as established by Lockheed and SDC. These same market realities contributed to two other policy decisions made by the NASIC administration during the initial dissemination phase of

program development.

The first of these decisions related to the decentralized nature of administration and decision-making concerning the search service operations established in the libraries of universities affiliated with NASIC. While NEBHE/NASIC negotiated and maintained the contracts with the search service vendors for all affiliate institutions and handled all financial transactions between participating institutions and the vendors, all other administrative components of the provision of on-line bibliographic search services at each institution were handled locally. NASIC here perceived its role as one of offering advice and consultation in an effort to enable each university to benefit from the experiences of other participants. But the actual decisions in the areas of service charges and subsidization, purchase or rental of equipment, publicity, and other areas of implementation were made within each library.

The philosophical justification for this decentralized organization was that the needs of such diverse institutions were so different that it made no sense to try to impose formal rules of organization on the search service operations. Furthermore, the provision of computerized search services was such a new area of activity that no one could, with any legitimacy, say that one form of service organization was clearly superior. On the practical side, it would have been very difficult if not impossible to impose a series of administrative requirements for affiliation with NASIC on the participating institutions, particularly since they all had the option of obtaining search

services directly from one or both of the vendors.

A second important policy of NASIC formulated during this period related to charging for services. At no time during the planning or implementation of the NASIC activity was the possibility of subsidization of search services by NASIC ever contemplated; it was always realized that search service charges would have to be covered either by the end user or the library or some other administrative section of the host institution.

During this phase of the program, it was decided by the NASIC administration to provide the program's "value added" services to affiliated institutions at no cost, other than travel and living costs for library staff attending a workshop in Wellesley. This policy was based partially on the NEBHE position that the purpose of the grant from NSF was to implement provision of machine-readable search services at the colleges and universities of the region and that grant funds should be expended to aid in this implementation process.

The more important basis for this decision was directly related to the realities of the market as determined by the vendors. Since both SDC and Lockheed sold services on a no subscription, no monthly minimum basis, it would have been very difficult to persuade institutions to obtain services under NASIC auspices if that would have entailed a subscription fee or any other form of additional costs. And even if institutions did perceive the value of NASIC-type intermediary services and were willing to pay for such services, the absence of a record of demonstrated capability by the NASIC program would have

discouraged initial institutional support.

The decisions of the initial organizational phase of NASIC delineated the program and created a framework of feasible and manageable tasks. The activities and decisions of the initial dissemination or test phase gave to the NASIC staff the opportunity to prove itself to the program's constituency and thus pave the way for the rapid increase in the number of participating institutions.

EXPANSION

By the end of September 1974, the 19th month of program development, NASIC had defined its role and tasks and demonstrated an initial competence to undertake those tasks and to introduce in the region's academic libraries effective computerized bibliographic search services. The major objectives for the succeeding months were: (1) to expand participation in NASIC to a substantial number of academic institutions in the region, and (2) to develop sufficient in-house expertise, particularly in relation to training capabilities, to enable the staff to decrease and ultimately eliminate reliance on MIT personnel.

The activities undertaken to expand the number of participating institutions were almost exactly the same as those described above in relation to the recruitment of the test libraries. "Academic marketing" contacts and meetings, training workshops at the NEBHE offices, training follow-up sessions on the campuses of the affiliated universities, and consultation efforts to assist in the effective initiation of local search service operations all continued in a manner similar to that earlier employed. Modifications were made only as the individual staff members learned from prior experience and avoided earlier mistakes.

The one added activity was the provision of assistance in user education activities. The NASIC program, even in the first proposals drafted for National Science Foundation consideration, recognized that the ultimate success of machine-readable search services in the academic environment depended on the ability to

persuade the community of potential users of the utility and worth (in both an intellectual and monetary sense) of these services. For this reason the NASIC staff devoted considerable effort, in the test libraries and later in all participating institutions, to working with affiliated libraries in a program of end user education.

The most successful format for user education was one in which a verbal presentation, describing the search services and the means for obtaining them in the local environment, was combined with an actual demonstration of on-line search services, preferably utilizing requests obtained from local students and faculty. NASIC staff visited every participating institution, in almost all cases two or more times, for day-long demonstration sessions. At these sessions, the NASIC staff assisted the local librarians, answering questions and bolstering confidence of newly trained ISLs, but would leave the actual demonstration of services to the local searchers in order to assure potential users that the new library service was in fact available locally and not dependent on a visiting expert from Wellesley.

The amount of time and effort devoted by the NASIC staff to marketing, training, consultation and user education activities for the second half of the grant period is documented in Table 1. As a result of the intensive training activity documented in this table, the NASIC staff was able to acquire sufficient expertise to diminish and then eliminate the dependence on MIT personnel for training presentations.

TABLE 1

LEVEL OF ACTIVITY DIRECTED TOWARD NASIC PROGRAM EXPANSION

ACTIVITY	QUARTERS					
	7TH	8TH	9TH	10TH*	11TH	12TH
"ACADEMIC MARKETING" VISITS TO INSTITUTIONS OR MULTI-INSTITUTION MEETINGS	18	6	15	4	7	1
CUMULATIVE NUMBERS OF NASIC AFFILIATED INSTITUTIONS	11	18	22	27	33	35
NEW USER TRAINING WORKSHOPS CONDUCTED	3	3	1	2	3	1
NUMBER OF INSTITUTIONS PARTICIPATING IN WORK-SHOP SESSIONS	10	16	8	10	21	11
FOLLOW-UP TRAINING SESSIONS ON CAMPUS	10	10	9	3	9	10
ADMINISTRATIVE CONSULTATION VISITS TO INSTITUTIONS	5	6	5	4	3	5
USER EDUCATION SESSIONS ON CAMPUS	3	9	16	0	25	10

33

34

*THE 10TH QUARTER, IN 1975, OCCURRED DURING THE SUMMER, TRADITIONALLY A VERY SLOW PERIOD OF ACADEMIC-RELATED ACTIVITIES.

By the eighth quarter of the Foundation grant period, NASIC staff was conducting the workshops almost independently but utilizing the assistance of vendor representatives, per the agreements between NASIC and the two primary vendors.

This move for independence was adopted as a specific policy of the program during the expansion phase. As planned, the acquisition of in-house expertise enabled NASIC to solidify its status as a source of useful services and to acquire an image of competence and self-sufficiency. In addition, this independence enabled the NASIC management to terminate the contract with MIT (but not the participation of the MIT Libraries in NASIC) earlier than originally anticipated. The funds that had been committed for a contract between NASIC and MIT were then utilized to underwrite the cost of newly-defined tasks, as will be described in the following section.

CONSOLIDATION

While affiliation, introductory training and effective implementation of campus-based searching operations were all necessary before NASIC could be considered a full-fledged intermediary, continued viability in this role required that activities be undertaken that would be of ongoing utility to institutions and their searchers months and years after the services had been initiated. For this reason, beginning in the eighth quarter of program development and concurrent with the expansion effort described in the previous section, the NASIC staff initiated a group of activities that would augment and consolidate its role as an effective intermediary.

The most visible and interesting of these activities was the development of a reference tool for the trained searcher, a tool that was ultimately published and distributed as the *Nasic Search Aids*. As indicated earlier, a major component of the NASIC training program was the development of materials to supplement those available from the vendors. For the most part, these materials consisted of detailed presentations on the data bases accessible through the systems of the two primary vendors. This constituted a massive task that by the end of the grant period encompassed 30 documented presentations averaging 50 pages each. (Sample pages extracted from one of those presentations are attached as Appendix A.)

In addition to this package of training materials, the NASIC staff perceived the need for a multi-system, multi-data base

User Manual that could be used by library personnel as a reference tool in the conduct of computerized searches. This manual would include brief reviews of system procedures and protocols, descriptions of computerized data bases and their relationships to printed indexes, matrices of searchable data elements, descriptions of common problems of particular systems and data bases and the most effective solutions to these problems, and a correlative index of systems, data bases and subject areas. This manual would also refer to appropriate sections of supplier-produced manuals to enable the ISL to obtain more detailed information when required.

The NASIC administration originally anticipated that production of this manual would be included in the work to be performed by the MIT personnel under the NEBHE-MIT contract. While some of the material required for such a manual was gathered and documented by the MIT people, it became clear as early as the sixth quarter of the program that the actual manual organization, writing and production would not be undertaken as part of the contract work.

Since the existing NASIC staff did not have the time to undertake this task without having to limit other activities, such as the all-important ISL training program, the NASIC administration decided to utilize the remaining funds in the budget category for contracts for development of the manual by a consulting firm with extensive information processing experience. Accordingly, a Request For Proposal (RFP) was drafted and sent to ten East Coast firms seen as having the capability

to undertake the project. Prior to the bidders' conference, however, the NASIC Advisory Board unanimously recommended to the program administration that every effort be made to undertake the project in-house by re-scheduling other tasks and hiring additional staff as necessary for the anticipated term of the manual production task. Based on this recommendation, the NASIC management submitted to the National Science Foundation a request to transfer program funds from the contract category to various direct expenditure lines, particularly salaries and wages, so that additional staff could be hired. The Foundation approved this request, and by the beginning of the ninth quarter (March 1975), NASIC had formally cancelled the RFP, hired staff and initiated detailed planning for manual production.

Keeping the audience of the trained searcher in mind, the staff designed the reference tool, then called the User Manual, to reinforce the NASIC training program and to remind the ISL of both system and data base capabilities, features and problems. The User Manual was viewed as a supplement rather than a replacement for the manuals provided by the vendors and accordingly was to place much more emphasis on data base content, indexing policies and idiosyncracies than did the vendor documents.

During the ninth quarter, the staff completed revised drafts on the sections dealing with one vendor's search system and two data bases. These were sent for review to representatives of the data base producers and the vendors, to certain ISLs at NASIC institutions and to members of the NASIC Advisory Board.

It soon became clear that development of the manual was a

more formidable task than originally anticipated. Variations and inconsistencies in the implementation of the data bases required frequent and formal consultation with the staffs of the vendors. In some cases, the NASIC documentation of these inconsistencies led to system modifications by the affected vendor in order to eliminate the problems. In addition, the Advisory Board urged the staff to develop more detailed presentations than had been contemplated.

By the tenth quarter, a major reformulation of the plans concerned the actual production of the document, at this point called the NASIC Searcher Manual. Feedback from both vendor and ISI reviewers indicated that newly planned vendor user manuals (at that time partially distributed by SDC and in production by Lockheed) would increase the redundancy factor of the NASIC document to a level that made the proposed Searcher Manual production costs to NASIC and the vendors substantially greater than the benefits that would be derived.

In response to this evaluation, the NASIC staff decided to modify the materials to be produced, a decision that was reaffirmed by the NASIC Advisory Board. The new plans called for the development of the following materials:

1. An annotated Quick Reference Chart (QRC) on each data base accessible through one or more systems, indicating the searchable fields, limits and print formats. Each chart would include precautionary notes (or potential pitfalls) related to searching the data base covered;

2. A series of annotated searches on each data base documenting effective search techniques for that data base on that system;

3. A group of annotated complex searches, utilizing multiple data bases and systems, to document the intellectual processes involved in provision of bibliographic search services; and

4. An updated and annotated compilation of all data base-related materials used by NASIC staff in the training workshops.

It was agreed that all four of these items would fill an unmet need of a specific audience (trained searchers) and could be effectively produced by existing NASIC staff in the remaining months of the program.

During the eleventh quarter work was concentrated on the most important of these reference tools, the collection of annotated Quick Reference Charts, one for each data base accessible through one or both of the vendors' systems. These charts indicated searchable fields, limits and print formats and included precautionary notes relating to searching the particular data base. The first component of this collection, now called the *NASIC Search Aids*, covering the systems themselves and six data bases accessible on each system, was published and distributed during this quarter to the Information Services Librarians previously trained by the NASIC staff. A photocopy of the sample materials for a data base rather than the original QRC, which was

printed on both sides of colored card stock and index tabbed, is included in this report as Appendix B.

During the twelfth quarter the second component of the *NASIC Search Aids*, including QRCs and Notes on ten additional data bases, was published and distributed, and in June 1976 the final set of materials, covering an additional seventeen data bases, was issued.

Evaluation of the *NASIC Search Aids* by searchers in the NASIC participating institutions was so positive that the staff decided to launch a small marketing effort to sell the materials to libraries and organizations involved in bibliographic searching but not participating in the NASIC program. This would have the dual benefit of increasing the distribution of a useful tool and providing the NASIC program with a certain amount of revenue that would assist in the ultimate viability of the program. Accordingly, the staff made presentations regarding the *NASIC Search Aids* at various library and information science meetings and sent out announcements of the availability of these reference aids. The results were extremely encouraging; a second printing had to be ordered at the end of the thirteenth quarter. By late August 1976, more than 100 sets had been sold, yielding revenues to NASIC in excess of $4,500.

The history of the development of the *NASIC Search Aids* is of interest not only because of the quality and utility of the materials themselves but also because of the decision-making process involved. Early in the history of NASIC, a lack of sufficient information regarding the extent of the materials to

be covered and a resulting inability to define what was actually desired led to inappropriate decisions by the NASIC management. These decisions called for the production of the multi-system, multi-data base manual under the terms of the MIT-NASIC contract, an impossible condition given the financial resources made available to MIT under the contract.

Even when the parameters of content and format were settled, there remained a tendency to underestimate the time required for the total task, given the inevitable reviewing delays and the addition of several data bases as well as the time-consuming requirement to check every element and feature of each data base for problems and inconsistencies. The result was a continuing delay in schedules, with production and distribution completed approximately eight months later than originally planned, and a document that was far less detailed than originally conceived. Furthermore, the unanticipated scope of the project resulted in tight schedules and totally precluded development of the other three kinds of reference materials (annotated simple searches on each data base, annotated complex multi-data base searches, and annotated NASIC training materials) that had been decided upon as late as the tenth quarter of NASIC development.

On the positive side, the history of the development of the *NASIC Search Aids* demonstrated several examples of highly effective decision-making. As additional information became available, the NASIC administration demonstrated a willingness to modify earlier decisions as required. Furthermore, substantial effort was made to obtain this type of information, especially from ISLs

and the NASIC Advisory Board, even though it was likely that the results would be modification of plans and further delays. No irrevocable decisions regarding either content or format were made until there was virtually unanimous approval from staff, vendors, constituency and Advisory Board. And at no time was a diminution of quality ever contemplated, even though adherence to this standard resulted in long delays and the production of fewer materials than had been planned.

On balance, one must conclude that the decision-making process for this task was effective, even if not as efficient as one might hope. In the end, delays and materials hoped for but never produced are forgotten if the resulting products are valuable. NASIC's reputation across the nation and the solidity of its role as an intermediary were both greatly enhanced with the production of the *NASIC Search Aids*. Furthermore, the prospects for the ultimate ability of NASIC to be a self-supporting enterprise were greatly improved as a result of the quality of the *NASIC Search Aids*, both because of the revenue resulting from their sale and because of the increased level of paid institutional affiliation with the program resulting from the demonstration through these materials of the utility of NASIC as an intermediary.

Finally, a certain amount of attention must be paid to the issue of staff morale. In any funded project with a definite time or monetary limit, there are problems in maintaining a high level of staff morale, particularly in the closing months of the funding period. Such problems are exacerbated by the

frustrations and delays inherent in any effort as complex as the production of the *NASIC Search Aids* turned out to be. The continuing emphasis placed by the NASIC administration on the quality of materials being produced helped to maintain the pride of the staff in the work being undertaken.

A second activity related to consolidation of NASIC's role as an intermediary was the development of a series of workshop sessions for experienced users. These sessions either concentrated on one or more of the newly accessible or more complex data bases or provided already trained ISLs with information on new system capabilities, assistance in development of complex search strategies, and hints for achieving quicker and less expensive searches. These sessions were frequently conducted with the cooperation and assistance of representatives of the relevant data base producers and system vendors, thus providing detailed information about the material covered as well as an opportunity to offer feedback from user to supplier.

These sessions for experienced users were initiated during the tenth quarter of NASIC activity. In that quarter, four such workshops were attended by ISLs from 14 affiliated institutions. In the twelfth quarter an additional three sessions were attended by staff from 11 libraries, while the three sessions in the thirteenth quarter had participants from 25 of the NASIC affiliates. Because of the utility and acceptance of these training sessions, the future need for NASIC services was demonstrated.

Another important role for NASIC has been that of spokesman

on behalf of the user community, particularly the academic user community, before the data base producers and search service vendors. It is not easy to document the extent of this activity because the process of interaction with all parties involved in providing computerized search services is both informal and continuous. Nor is it possible to measure the impact of this activity, except indirectly through the interest of the two major vendors in continuing their working arrangements with NASIC (and that of other vendors in establishing such arrangements) and the willingness of NASIC participating institutions to continue to maintain their affiliation with the program.

The one example in which the feedback role of NASIC can be documented is that of the two Users' Conferences held in the twelfth quarter. The sessions were held on consecutive days in the Boston area and Philadelphia in order to encourage participation by as many administrators and ISLs from affiliated institutions as possible. The level of attendance -- 65 participants from 14 institutions at the Boston session and 63 from 14 institutions at the Philadelphia session -- and the interest in sharing experiences and exchanging ideas with staff of other libraries and vendor representatives demonstrated that this type of session was a useful activity and one that should be a regular part of the NASIC program.

A relatively minor component of the consolidation activities of NASIC was the initiation of a small data collection effort in the ninth quarter of program development (March 1975). Since data collection is normally an important component of the

evaluation process of programs funded by the National Science Foundation, an explanation of the almost total absence of data on NASIC activities is appropriate.

The primary questions regarding evaluation relate to the subject being evaluated and what data are useful or essential in performing the evaluation. As indicated earlier in this report, the three objectives of NASIC were "the evaluation of the need for an intermediary and the accompanying definition of its role, the demonstration of effective performance in that role, and the determination of the capability of such an intermediary organization to support itself after grant funding has expired." (See page 3.)

The extensive activity of NASIC, the participation in the program by 35 institutions, including the most prominent in the region (see Figure 1), and the willingness of vendors and data base producers to cooperate with NASIC by themselves document at least a perceived need for an intermediary as well as the effectiveness of the program in defining an appropriate role. For the evaluation of these two objectives, data collection appears to be of limited utility.

In regard to the third objective, that of self-support after the expiration of grant funding, the success or failure of NASIC will be proven by the financial balance sheets. While some early estimates are possible and are provided in the NASIC 1976-1977 section of this report, an effective evaluation will not be possible until late in the fiscal year during which the grant support terminated.

- Figure 1 -

INSTITUTIONS PARTICIPATING IN NASIC PROGRAM
(JUNE 1976)

Adelphi University
Boston College
Bowdoin College
Brown University
Carnegie-Mellon University
Columbia University
Dartmouth College
C.S. Draper Laboratory
Drexel University
Harvard University
Massachusetts Institute of Technology
M.I.T. Lincoln Laboratory
New York Institute of Technology
Northeastern University
Pennsylvania State University
Plymouth State College
Princeton University
Rensselaer Polytechnic Institute
Rutgers - The State University of New Jersey
Stevens Institute of Technology
Temple University
Tufts University
University of Connecticut
University of Delaware
University of Maine at Portland/Gorham
University of Massachusetts/Amherst
University of Massachusetts/Worcester
University of New Hampshire
University of Pennsylvania
University of Rhode Island
University of Rochester
Woods Hole Oceanographic Institution
Worcester Foundation for Experimental Biology
Worcester Polytechnic Institute
Yale University

The only firm statement that can be made at this time is that the program did not terminate at the moment that Federal support ended.

The effectiveness of NASIC as an intermediary is a question for which data might be collected as an aid to evaluation. But exactly how one can evaluate this effectiveness and what data should be collected are questions that neither the NASIC administration nor its Advisory Board has been able to answer satisfactorily. Obviously one series of measures related to the level of activity of the NASIC staff and includes the number of institutions participating, the number of training sessions held, and the like. This kind of information has already been presented in earlier sections of this report.

The major issue, however, is whether one should or can evaluate the effectiveness of NASIC as an intermediary by the nature and extent of utilization of computerized search services by the institutions participating in the program. It can be argued that if the goal of NASIC was the more effective utilization of this new information resource by the academic community of the Northeast then the true measure of NASIC's success lies in a comparison of the utilization of these services by NASIC affiliates as compared with other colleges and universities that initiated computer search services without participation in the NASIC program. The counterargument holds that the local factors affecting utilization -- such as organization and attitudes of the library staff and the financial position of the institution -- are of such significance as to make highly questionable any

conclusions based on institutional data regarding the effectiveness of the intermediary.

During the early months of the experimental NASIC operation in the MIT Libraries, a significant data collection activity was undertaken under the provisions of the MIT-NASIC contract. The results of this activity were included in the earlier NASIC reports. See Figure 2 for a complete list of NASIC publications, including the *Phase 1 Report* and *Year 2 Report*. Based on this activity, the NASIC administration decided that the benefits of an extensive data collection effort did not justify the costs and that data collection would therefore be less emphasized in the program's activities.

Given the uncertain utility of the data to be collected and having noted the substantial amount of time and effort required at MIT to gather and process the data, the NASIC administration concluded that to request extensive data collection by participating libraries would put an added burden upon those libraries at the same time that the mere introduction of computerized search services was already creating a visible increase in the workload of the reference staffs. Also, particularly early in the NASIC expansion effort, when the advantages of obtaining search services under NASIC auspices had not been clearly demonstrated, the NASIC administration feared that the inclusion of a data collection obligation in the conditions for participation in NASIC might convince at least some librarians that it was more in their interest to obtain these services directly from the vendors rather than through an intermediary.

- Figure 2 -

LIST OF PUBLICATIONS

Gardner, Jeffrey J.; Wax, David; and Morrison, R.D., Jr. "The Delivery of Computer-Based Bibliographic Services by Academic and Research Libraries." *ARL Management Supplement* 2(2), (September 1974).

Gardner, Jeffrey J., and Wax, David M. "On-Line Bibliographic Services." *Library Journal* 101(16), 1827-1832, (September 15, 1976).

Miller, Ronald F., and Wax, David M. "NELINET, NASIC and The Academic Library User." In *New Dimensions for Academic Library Service*. edited by E.J. Josey. Metucher, N.J.: The Scarecrow Press, Inc., 1975, 256-267.

Northeast Academic Science Information Center. *Lockheed Information Systems DIALOG Interim Manual* (September 1975) Wellesley, Massachusetts, New England Board of Higher Education, 1975.

Northeast Academic Science Information Center. *NASIC Search Aids* (1975-1976) Wellesley, Massachusetts, New England Board of Higher Education, 1976.

Northeast Academic Science Information Center. *Phase I Report* (March 1973-February 1974) Wellesley, Massachusetts, New England Board of Higher Education, 1974. 4 vol. [NTIS accession nos. PB-234 997/AS, PB-234 998/AS, PB-234 999/AS, PB-235 000/AS] [ERIC accession nos. ED 094 754, ED 094 755, ED 094 756, ED 094 757]

Northeast Academic Science Information Center. *Year 2 Report* (March 1974-February 1975) Wellesley, Massachusetts, New England Board of Higher Education, 1975. [NTIS accession no. PB-241 312/AS] [ERIC accession no. ED 107 211]

Wax, David M. "NASIC and the Information Service Librarian: Room In The Middle." In *Proceedings of the 1975 Clinic on Library Applications of Data Processing: The Use of Computers in Literature Searching and Related Reference Activities in Libraries*. edited by F. Wilfrid Lancaster. Urbana-Champaign, Illinois: University of Illinois, Graduate School of Library Science, 1976, 78-90.

Wax, David M. *On-Line Bibliographic Search Services*. Association of Research Libraries Occasional Paper, Number 4, (June 1976).

A final reason was a concern that the development of the data gathering instrument, the continuous follow-up required to insure timely submission of the data to NASIC, and the time required to aggregate and analyze the data collected would place a substantial burden on the NASIC staff, thereby diminishing the time that could be allocated to the other activities already described. This concern was borne out by the later difficulty of assuring submission of even the simple one-page data collection form utilized by the program during the third year of activity.

By the end of the eighth quarter of NASIC development, the expansion of the program was progressing at a sufficiently rapid rate that the NASIC administration agreed to initiate a limited effort to obtain information from participating institutions on the extent and kinds of services they were actually providing to their communities. The most significant information collected is summarized in Tables 2-4.

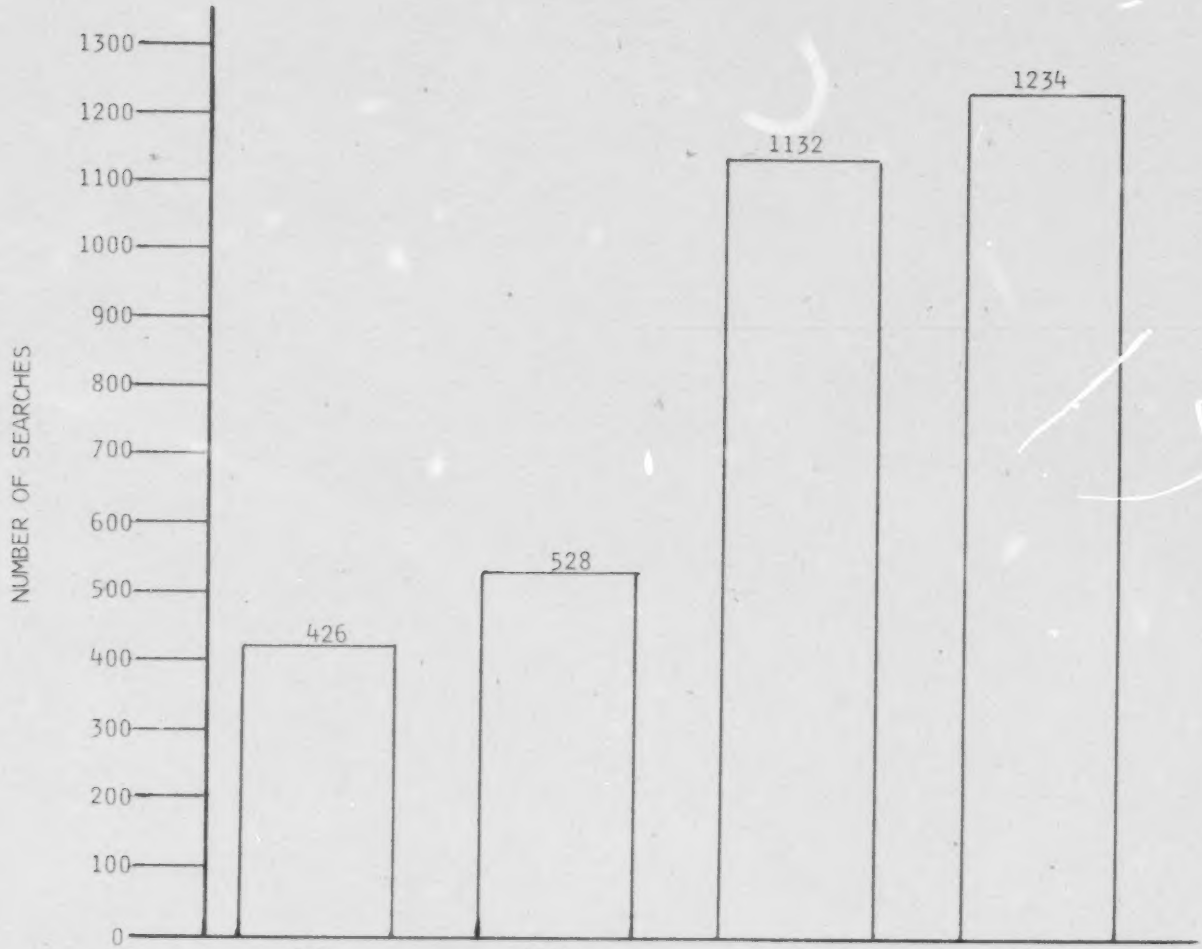
Emphasizing that the data in these tables reflect system usage during the period March 1975 through February 1976 when both SDC and Lockheed had different system capabilities and fewer data bases available than they do now, the following observations can be made.

The most important conclusion of Table 2 is not that the use of search services by NASIC institutions increased -- an expected result as the number of participating institutions and trained searchers increased -- but the consistent, proportionate utilization of the six data bases most heavily searched by NASIC libraries, three of which were only available on DIALOG at that time.

TABLE 2

NASIC USAGE SUMMARY-1

MOST HEAVILY SEARCHED DATA BASES
MARCH 1975 - FEBRUARY 1976



DATA BASE:				
ERIC	128	129	179	277
CA-CONDENSATES	103	139	173	277
INSPEC/ISMEC	62	109	400	228
NTIS	61	75	212	176
PSYCHOLOGICAL ABSTRACTS	48	60	120	168
PREDICASTS	24	16	48	108
TOTAL	426	528	1132	1234

TABLE 3

NASIC USAGE SUMMARY-2

MEAN AND MEDIAN NUMBERS OF SEARCHES
MARCH 1975 - FEBRUARY 1976

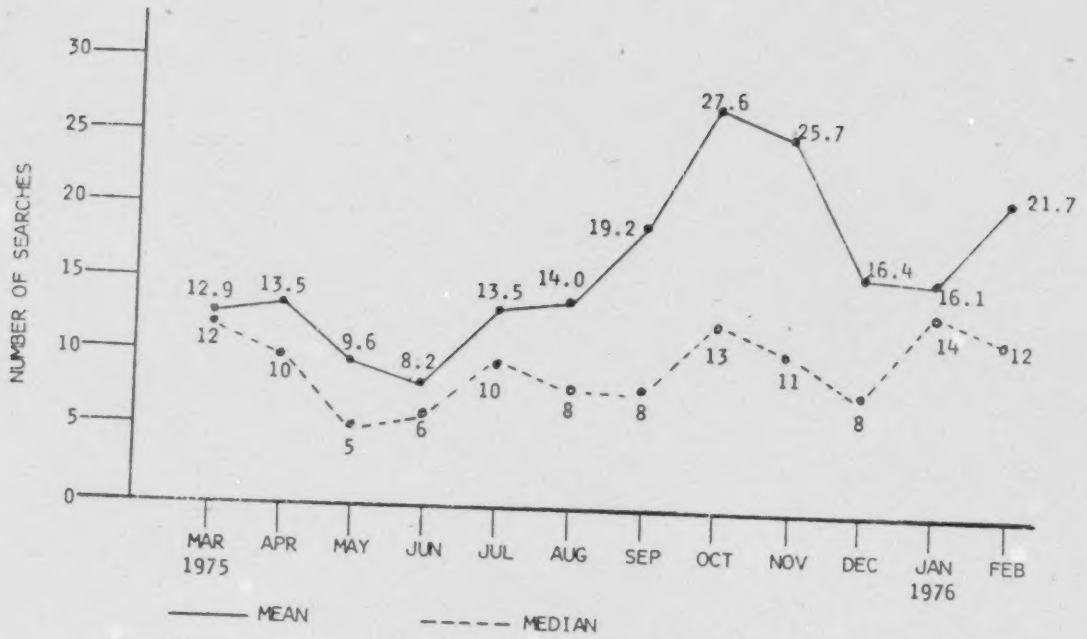
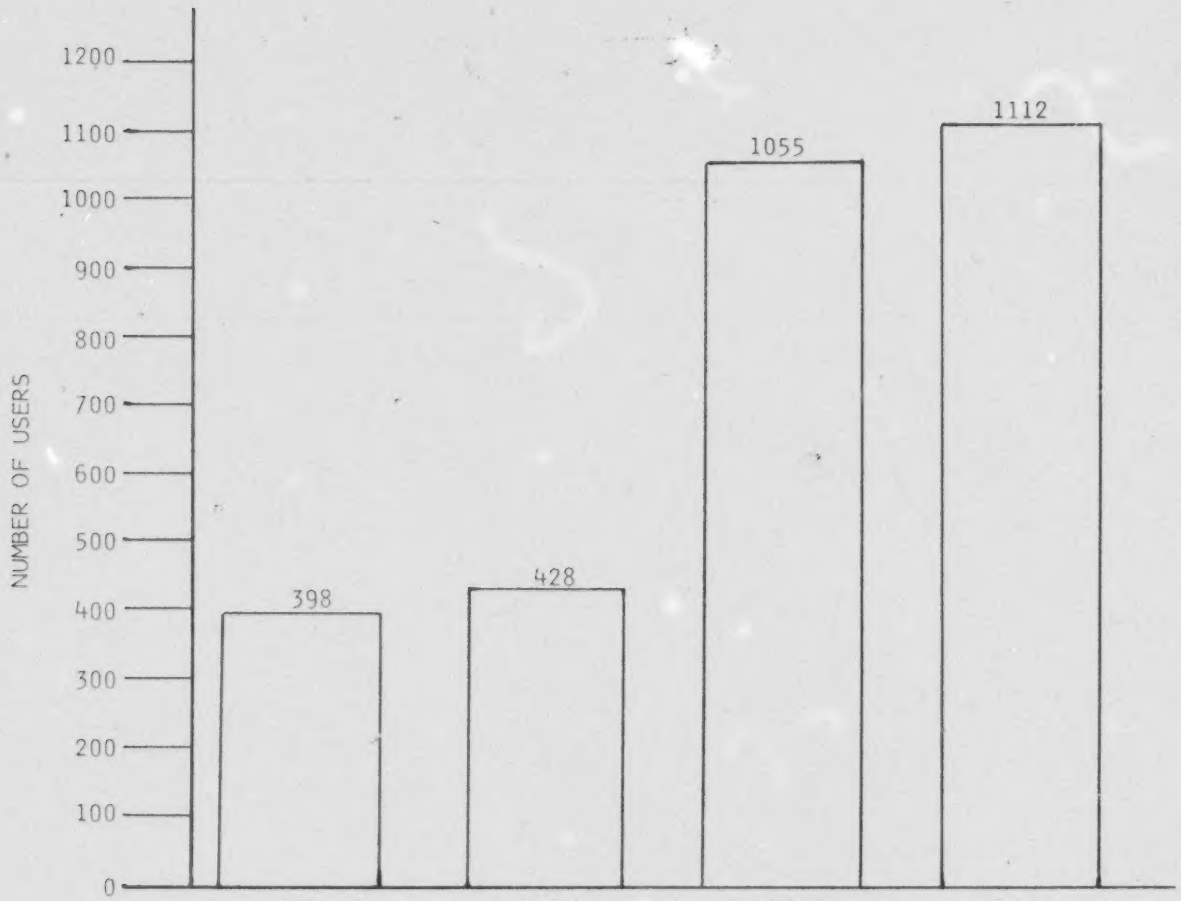


TABLE 4

NASIC USAGE SUMMARY-3

NUMBERS OF USERS BY CATEGORY
MARCH 1975 - FEBRUARY 1976



UNDERGRADUATES	12	5	47	43
GRADUATE STUDENTS	201	177	250	432
FACULTY	95	111	203	328
UNIV. STAFF & ADMIN.	46	84	479	177
NON-CAMPUS EDUCATORS	22	26	40	48
OTHER	22	25	36	84
TOTAL	398	428	1055	1112

As other major data bases became available during this period, notably BIOSIS PREVIEWS, substantial use was also observed. Because BIOSIS PREVIEWS had not been accessible during the whole period, statistics were not included in the summary data.

Table 3 shows the mean and median numbers of searches performed at the reporting NASIC institutions during each of the 12 months for which data were collected. Both the mean and median are consistently lowered by the presence of several institutions in which searching has not been implemented as a regular service -- that is, institutions at which fewer than three searches per month were performed.

This table, viewed in conjunction with Table 4, which documents the almost total absence of use by undergraduates of search services, emphasizes the most serious obstacle to intensive use of on-line search services in the university environment -- cost. Without discussing the issue of whether costs of search services are fair or excessive, one can perceive that present costs do inhibit academic use. Few universities can afford to subsidize searching on an ongoing basis -- many could not even subsidize services during the implementation phase -- and most faculty and students either are not yet convinced as to the utility of search services or are persuaded but unable or unwilling to pay the price of these services. Nonetheless, the increase in the mean number of searches does indicate that, at least at some academic institutions, the use of on-line services is beginning to be accepted.

Perhaps the most interesting question left unanswered by

these data and by the NASIC experience in general relates to the variations in levels of acceptance of this new service by different academic libraries. A study of this issue, whether alone or in the wider context of acceptance of innovation by university libraries, was outside the scope or capability of the NASIC program but would be of interest and utility to the information community.

Efforts were also made by the NASIC staff to consolidate the position of the program as an effective intermediary by increasing the awareness in the information community, both in the Northeast and across the nation, of the activities and successes of NASIC. One component of this effort was the participation in panels and the presentation of papers at meetings on the regional and national levels. Figure 3 provides a partial listing of the organizations at which presentations were made by members of the NASIC staff. Also very significant, but not listed in Figure 3 because no presentation on NASIC was made, was the 1975 annual meeting of the American Library Association at which the New England Board of Higher Education was awarded, for the NASIC program, the first annual Dartmouth Medal "to honor achievement in creating reference works outstanding in quality and significance."

In addition to these presentations, several publications have increased NASIC's visibility in the information community. These reports and articles are listed in Figure 2. Perhaps the most important of these publications is *A Handbook for the Introduction of On-Line Bibliographic Search Services into Academic Libraries.*

- Figure 3 -

ORGANIZATIONS RECEIVING PRESENTATIONS ON NASIC

ON THE REGIONAL LEVEL

- Special Libraries Association, Boston Chapter, February 1974
- New England Library Association, September 1974
- Nassau-Suffolk Library Institute, October 1975
- Maine Academic and Research Librarians, October 1975
- Joint Meeting of New England Library Information Network (NELINET) and Association of College and Research Libraries (ACRL), November 1975
- Special Libraries Association, Boston Chapter, March 1976
- Simmons College/ASIS, New England Chapter Institute, March 1976
- Massachusetts Library Association, May 1976
- East Coast Marine Science Librarians, September 1976
- Special Libraries Association, Boston Chapter, March 1977
- Library Group of Southwestern Connecticut, Inc., March 1977

ON THE NATIONAL LEVEL

- Association of Research Libraries, May 1973
- EDUCOM, October 1973
- University of Illinois Twelfth Annual Clinic on Library Applications of Data Processing, April 1975
- Engineers Joint Council Seminar/Workshop on Information Tools for Engineering Education and Research, July 1975
- Association of Information Dissemination Centers (ASIDIC), September 1975
- National Federation of Abstracting and Indexing Services (NFAIS), March 1976
- National Information Retrieval Colloquium, May 1976
- Midwest Region Library Network (MIDLNET), June 1976

The published version of this final report does not include a copy of that handbook. Copies may be ordered, at a cost of $5.00 each prepaid, from the Office of University Library Management Studies of the Association of Research Libraries, 1527 New Hampshire Avenue, N.W., Washington, D.C. 20036. This handbook has been widely distributed to research libraries through the offices of the Association of Research Libraries and has thereby brought NASIC to the attention of a significant section of the information community.

All of the consolidation activities discussed in this section were undertaken with the dual aim of offering immediate benefits to the libraries presently participating in the NASIC program and of developing a range of products and services that would be of continuing utility to the information community. If such products and services are available and sufficiently publicized in that community, there is a far greater likelihood that the level of interest in obtaining search services under NASIC auspices will be sufficiently high to assure the continuing financial viability of the program.

TOWARD SELF-SUPPORT

The organization, activities and financial viability of NASIC for the period following the termination of National Science Foundation funding was a matter of concern to the program administration from the early months of program development. A serious consideration of alternative plans was not possible, however, until decisions were made regarding the specific nature of program activities during the funded period and until there was some perception of the demand for NASIC services and the willingness of participating institutions to provide financial support to the program. Thus, it was not until NASIC had completed its development phase and was well into its expansion phase that detailed planning for the future could begin.

Discussions with the NASIC Advisory Board regarding the program's future began during the eighth and ninth quarters of program development. During the tenth quarter, the future of NASIC was also a major topic of discussion at meetings of two other bodies. The first of these was the Governance Committee of the New England Library Information Network (NELINET), a program of NEBHE that is financially supported by member institutions, many of which were also participants in NASIC activities. At the second meeting, with the NEBHE Futures Committee, discussion centered on the future of NASIC in the context of the total plan of activities of NEBHE. While no final decisions were made at that meeting, it was clear that the Board was committed to some type of test in fiscal 1976-77

of the potential of NASIC for self-support. During the twelfth quarter, NASIC received a commitment from NEBHE for sufficient funds to assure NASIC's operation through the 1976-77 fiscal year, which would be sufficient time to test the viability of the program on a totally self-supporting basis.

Meanwhile, in preparation for the need to become self-supporting, the program increased the prices of its NASIC CENTRAL retail search services, effective January 1976. Historically, NASIC CENTRAL had charged educational users at a rate that would allow for recovery of out-of-pocket costs but not staff time or overhead. The new pricing algorithm included recovery of all components, resulting in an increase of 40-60 percent in per minute charges. The price for non-educational users continued at 150 percent of the educational rate, resulting in a substantial increase over pre-January prices.

By the thirteenth quarter, the major activity of the NASIC staff was directed toward the planning, negotiation and first steps of implementation of reorganization to enable NASIC to continue its services after the termination of Foundation grant support. The final decision on the array of program services emphasized continued training and education activities; specific services would include training workshops at NEBHE headquarters as well as individualized training, user education (service demonstrations), and administrative consultation on-site at participating libraries. In addition, the development of training materials and other user aids would be continued as would the organization of user meetings to assist affiliated

institutions in sharing ideas and experiences. Finally NASIC would continue to provide retail search services through NASIC CENTRAL to users in the surrounding community that otherwise would not have access to on-line searching capabilities.

At the same time, the NASIC administration decided to discontinue those existing NASIC services that did not appear both to meet a need of the community of users of on-line search services and to offer the possibility for sufficient revenue generation to contribute to the financial viability of the program. Among the services no longer required were the collection and analysis of usage and user data. The central billing service was retained as a convenience for those affiliates that requested such service and were willing to maintain a deposit account with NEBHE.

The second major group of decisions involved the organization of the program. It was decided that NASIC would continue as a program of the New England Board of Higher Education, with the Coordinator reporting directly to the Executive Director of the Board. Operating as an informal user group, the program would make its services available only to organizations and libraries, but not individuals, that affiliate with the program, at a fee of $300 per year. Participation would no longer be limited by type of library or geographical location, and it was anticipated that a significant number of special libraries in the Northeast and academic libraries in other parts of the country would decide to affiliate with NASIC so as to be able to take advantage of the services provided. Finally, NEBHE

would retain an Advisory Board for NASIC made up of representatives of both academic and special library affiliates.

The third area of decision for the operation of NASIC in fiscal 1976-77 was that of budget. The annual budget for the program, assuming a staff of two professionals and one secretary, was set in the range of $90,000. It was anticipated that most or all of the necessary revenue would be generated through affiliation fees, charges for training and consultation, the sale of materials developed by the program (including the *NASIC Search Aids*) and fees for NASIC CENTRAL retail search services. In addition, there was the possibility of some outside support for provision of NASIC services to particular communities (e.g., liberal arts colleges) or for specific projects different from but related to NASIC's regular activities.

The final size of the NASIC staff and the level of expenditures was to depend on the number of affiliates and the quantity of services they wished to obtain from NASIC. Should the activity and revenue generated warrant, NASIC would increase the size of its staff. Should revenues not match expenditures, NEBHE agreed to underwrite the deficit resulting from operation of the program during the 1976-77 fiscal year. The latter guarantee provided to both affiliating organizations and staff the sense of security necessary for the program to avoid operating under the constant threat of fiscal crisis.

The success of the reorganized NASIC, as measured in terms of both services provided and financial viability, would depend on the number of libraries that affiliate with the program and

the level of utilization of NASIC services by those affiliates. During the thirteenth quarter, NASIC initiated an effort to encourage affiliation by both academic and special libraries involved in bibliographic search services. This effort involved the development and distribution of materials describing the reorganized NASIC and its services, presentations before library organizations and other meetings, and personal letters to library administrators throughout the Northeast. The initial response to this effort was quite encouraging, and by July 1, 1976, the beginning of the 1976-77 program year, there were 29 affiliates, including some consortia composed of several libraries.

The other component necessary to perform as an effective intermediary organization in the provision of search services was the establishment of continuing relationships with the vendors. During the thirteenth quarter, NASIC initiated discussions with System Development Corporation and Lockheed Information Systems, to continue, with certain modifications, the previously established working relationships. At the same time, discussions were also held with Bibliographic Retrieval Systems, Inc. (BRS), at that time a prospective third vendor.

The final aspect of activity related to the reorganization of NASIC concerned changes in the program staffing. The plan for fiscal 1976-77 called for the program to begin the new phase of activity with two professional staff members, an absolute minimum for the provision of NASIC services. The kinds of activities projected require a heavy emphasis on training, both at NEBHE and in the field, and, at least initially, less emphasis

on materials development. Consideration was also given to the need to maintain the necessary staff at the lowest possible expenditure level consistent with effective provision of services. These criteria resulted in steps to change both the quantity and nature of the program staff.

The transition to an operating program, once completed, as well as the smaller staff and budget, meant that NASIC had less demand for managerial activities. For this reason, the positions of Director and Assistant Director were eliminated and a new position, that of NASIC Coordinator, was created. The person appointed to this position, Patricia E. Vaughan, formerly the NASIC Information Services Librarian, continued an active role in the training activities in addition to handling the administrative components of the program.

To add to the staff capability for training and providing search services through NASIC CENTRAL, the program hired another librarian to fill the position of Information Services Librarian. The person selected for this position was Anne H. Ross, presently a librarian at Dartmouth College and an alumna of the NASIC training program.

While these staffing changes were occurring, the program also initiated steps to terminate present staff members whose services were either not required or outside the budgetary limitations of the planned 1976-1977 program activities. During the thirteenth quarter the Assistant Director was terminated as the first step in the transition phase to a smaller staff and budget. Arrangements were also made during that quarter for the

termination of the Director and the Information Scientist at the beginning of the 1976-77 fiscal year. These personnel changes represented the most difficult aspect of an otherwise relatively smooth transition from the development phase of NASIC to an operational program.

The decision-making process over the fourteen-month period of March 1975 through April 1976, during which the planning for the fiscal 1976-77 program took place, was not as direct or free of disagreement as the above description might imply. Nonetheless, the process worked relatively smoothly, mainly because the NEBHE and NASIC administrations had access to a wide range of opinions and advice from diverse sources, including staff and administrators of participating libraries, the NASIC Advisory Board, vendor representatives, National Science Foundation personnel, and other experts from the field of library and information science.

With so many decisions to be made and so many decision-makers -- including NEBHE/NASIC staff, vendors, and administrators of potential affiliates -- the final determination of the 1976-1977 program parameters was not achieved until the end of April 1976. This placed potential affiliates in a difficult position since they had not been able to make final budgetary plans regarding NASIC participation. This in turn placed greater pressure during the summer of 1976 on the diminished NASIC staff, since they were required to work on recruitment of affiliates as well as to continue to provide training and consultative services.

NASIC 1976-1977

Operating under a revised format, NASIC activities from July 1976 through April 1977 emphasized recruitment of program affiliates, negotiations with the vendors, a very active training schedule, the operation of the NASIC CENTRAL search service, and the organization of Users' Conferences for affiliate librarians.

To announce the new format of NASIC, NEBHE issued a press release early in the summer of 1976 to a number of library journals and newsletters as well as to local newspapers. In addition, detailed information was sent to all NASIC associates to enable a smooth transition in program continuity. NASIC also made selective mailings to members of local professional groups including the New England Chapter of the American Society for Information Science (ASIS) and the Boston Chapter of Special Libraries Association (SLA) describing the program services for special libraries in the New England area. NASIC revised its brochure to reflect the program changes and provide more current information about the NASIC CENTRAL search service.

By the end of the summer, there were 35 NASIC affiliates representing 52 institutions, including all but one former member. Most new affiliates were already aware of NASIC because of earlier conference presentations or by recommendations from other NASIC-associated librarians. They were now able to join NASIC because library type or geographic limitations had been eliminated. Three library consortia or networks (the Five Associated University Libraries (FAUL), Kansas City Libraries Metropolitan Information Network (MINET), and the Worcester Consortium for

Higher Education, Inc.) and one dual affiliate (Marine Biological Laboratory/Woods Hole Oceanographic Institution) constituted the multi-institutional affiliates. Since then, 12 additional affiliates have joined the NASIC program, resulting in a total of 50 affiliates by April 1977 (see Figure 4). Of the 50 affiliates, however, only ten represent special libraries -- a lower number than anticipated. Conversations with librarians have revealed that, in many cases, follow-up telephone calls or personal meetings very often persuaded the staff that affiliation with the NASIC program was necessary to initiate or enhance their on-line searching capabilities. During this period, the NASIC staff was quite aware of the necessity for more marketing efforts which, however, was not possible because of reduced staff.

To attract new NASIC affiliates and continue to serve NASIC associates which had now joined in affiliate status, an active training program was scheduled for the summer and fall of 1976. Working agreements with the commercial vendors, Lockheed Information Systems, Inc. and the System Development Corporation had to be concluded, however, before various introductory or advanced workshops could be arranged. The agreements provided for vendor staff assistance at workshops as well as free connect time to be used in training sessions and/or demonstrations. Realizing that the NSF support for the project was terminating shortly, the decisions by Lockheed and SDC to support NASIC as an ongoing intermediary organization demonstrated their recognition of the need for such an activity.

- Figure 4 -

NASIC AFFILIATES - APRIL 1977

Abcor, Inc.

Adelphi University

AFGL Research Library

Boston College

Boston University

Bowdoin College

Brown University

Cabot Corporation

Carnegie-Mellon University

Charles River Associates

Columbia University

Dartmouth College

Digital Equipment Corporation

Draper, Charles Stark, Laboratory

Drexel University

Energy Resources Co., Inc.

FAUL (Five Associated University Libraries)
Cornell University
State University of New York at Binghamton
State University of New York at Buffalo
Syracuse University
University of Rochester

Grace, W. R. & Company

Hampshire College

Harvard University

Houghton Mifflin Company

- Figure 4 -
Continued

Kansas City Libraries Metropolitan Information Network
Kansas: Johnson County Public Library
Kansas City Public Library
University of Kansas Medical Center Clendening Library

Missouri: Kansas City Public Library
Mid-Continent Public Library
St. Luke's Medical Library
University of Missouri at Kansas City

Library Group of Southwestern Connecticut, Inc.

Marine Biological Laboratory/Woods Hole Oceanographic Institution

Massachusetts Institute of Technology

Massachusetts Institute of Technology, Lincoln Laboratory

New York Institute of Technology

Northeastern University

Pennsylvania State University

Plymouth State College

Polaroid Corporation

Princeton University

Rensselaer Polytechnic Institute

Rutgers - The State University of New Jersey

Sanders Associates, Inc.

State University of New York at Albany

Stevens Institute of Technology

Temple University

Tufts University

University of Connecticut

University of Maine at Orono

University of Maine at Portland-Gorham

- Figure 4 -
Continued

University of Massachusetts at Amherst

University of New Hampshire

University of Pennsylvania

University of Pittsburgh

University of Rhode Island

Worcester Consortium for Higher Education, Inc.
Worcester Foundation for Experimental Biology
University of Massachusetts at Worcester
Worcester Polytechnic Institute
Worcester State College

Yale University

At the same time, NEBHE concluded a group contract with Bibliographic Retrieval Services, Inc. for its system which was expected to be available in January 1977. This agreement provided NASIC with the opportunity of actually becoming a broker and offering a discount to affiliates who would undertake a contract for the BRS system via NASIC. Furthermore, BRS expected NASIC to assume an active training role, relying on the known training skills of the NASIC staff to instruct affiliate librarians about both the system and the data bases, and thus provide more revenue by additional BRS training activities. BRS offered a different mix of services through which NASIC affiliates would pay lower prices for on-line searching and NASIC would gain some revenue both as a broker and a trainer.

To prepare for the introduction of BRS, NASIC staff attended the BRS Users' Meeting in December 1976 and subsequently received initial system training. Following up earlier newsletters, information about the system and the NASIC/BRS group contract was provided to the staff at all NASIC affiliates in November and December.

Because of the required minimum five hours of monthly usage for a six-month period with BRS, several librarians had to review their searching patterns carefully before considering whether to add the BRS system to their searching capability. In most cases, the opportunity to do more searching for the same or less money than they had been paying previously convinced library administrators to contract with NEBHE for use of the BRS system.

The early announcement of the BRS system availability and

its marketing approach allowed the already established vendors to develop plans for usage discounts and group contracts in anticipation of the competition by BRS. A month before the BRS system became operational, Lockheed announced rate reductions on two data bases, a mechanism for usage discounts with increased volume of searching and a group contract plan. As a result, NASIC had to supply more information to the affiliates about this alternative. Most large libraries recognized the inevitability of three or four systems being required by their user community. Currently, several data bases (MEDLARS, CONGRESSIONAL INFORMATION SERVICE, SSIE, SOCIOLOGICAL ABSTRACTS, etc.) are exclusively available on one of the commercial systems (BRS, Lockheed or SDC) and, at the same time, preferences for a system(s) have developed among the searching librarians. Therefore, some library staffs have allocated searching responsibilities among the searching librarians based on system preferences as well as subject disciplines. Alternatively, some library operations want the flexibility and reliability of having two or more systems to access for on-line data base searching.

During the fall NEBHE also reached a working agreement with a fourth vendor, the New York Times' Information Bank, whereby training could be coordinated by NASIC for its affiliates. NEBHE had already established its own contract with the Information Bank in August and arranged that the Information Services Librarian be trained so that NASIC CENTRAL patrons could be served. Furthermore, this data base was a unique information resource which would have special appeal to undergraduate college

libraries, special libraries and public libraries. Unlike other bibliographic data bases, the INFORMATION BANK contains news summaries extracted from certain *New York Times* issues, other national newspapers and news magazines as well as certain foreign newspapers. The September availability of the INFORMATION BANK at 30 cps via the Telenet communications system allowed NASIC affiliates the option of using their existing terminals to access this data base.

In July, two introductory, three-day DIALOG workshops were held which involved the immediate participation of the new Information Services Librarian. The fall training sessions at NEBHE headquarters included three (one DIALOG, two ORBIT) introductory workshops as well as three one-day advanced sessions. In addition to the two one-day sessions on newly accessible DIALOG data bases which NASIC staff conducted, a special CASIA workshop was developed with the assistance of Chemical Abstracts Service staff. During the summer and fall months NASIC trained 122 librarians from 30 affiliates by conducting eight workshops at NEHBE headquarters; in addition, NASIC conducted seven training sessions for 53 librarians at affiliate locations.

At a July meeting with staff from the Kansas City Libraries Metropolitan Information Network, the NASIC Coordinator initiated plans for NASIC staff to coordinate and/or conduct three separate training workshops in Kansas City during the fall and two workshops during the winter. This particular activity offered NASIC the opportunity to work directly with an

affiliate involving both public and academic libraries. Furthermore, one component of the training program addressed the non-searching library staff who needed information about on-line bibliographic retrieval in general and their role within the referral process in particular.

In addition to formal workshops at NEBHE headquarters and at affiliates' locations, NASIC also developed follow-up training sessions to meet the specific needs of a library. A two-day workshop was held in Rochester, New York for the FAUL affiliate group, and training was also conducted at two Harvard libraries, Charles River Associates, and Princeton University. Demonstrations of on-line searching were also presented at the University of Rhode Island, Charles River Associates, the Harvard Business School, and the University of Maine at Orono.

The frequency and scope of instructional sessions during this period surpassed any previous level of activity by NASIC. This effort was successfully accomplished because of the capability and enthusiasm of the program staff.

Training workshops during January and February 1977 focused on the new systems being offered by NASIC--BRS and the INFORMATION BANK--as well as about the Predicasts files available on Lockheed. NASIC held two BRS workshops at NEBHE headquarters, plus another BRS session in Philadelphia for affiliates located there, and a BRS session in Kansas City. Several other training sessions at NEBHE headquarters and at affiliate locations were scheduled for March, April, and May 1977.

NASIC librarians had requested that another Users' Conference

be held. In order to serve a wider geographic area, two identical conferences were planned for early 1977, one to be co-hosted by Drexel University and the other to be co-hosted by Boston College.

The Philadelphia NASIC Users' Conference, held at Drexel on January 13, was well-attended and favorably received. Panel presentations by a variety of NASIC affiliates about administrative aspects of providing on-line searching were held in the morning; data base discussion groups attended by specific data base suppliers and a panel presentation by the four commercial vendors constituted the afternoon portion. The NASIC Users' Conference held at Boston College on March 10 followed the same program but also included the viewing of videotapes produced by two local affiliates. Responding to a request by affiliates that NASIC issue some data describing its constituency, NASIC is compiling an informal directory listing the searching librarians, systems accessed, and statistics about library search services. Since the affiliate information was incomplete, NASIC is in the process of updating the records for distribution.

The NASIC CENTRAL search operation has continued to serve local colleges and universities which do not have in-house capability as well as commercial clients. To publicize NASIC CENTRAL in the summer of 1976, a mailing was issued to local academic institutions which conducted summer school or continuing education/evening school programs. With very little marketing, NASIC CENTRAL continues to perform about an average of five customer requests per month, a large proportion of which

are repeat users. While NASIC is aware that more promotion to both business and academic institutions would increase its searching operation, marketing cannot be emphasized until the program can ensure daily staff coverage in the office. The on-site and NEBHE workshop activities of NASIC during the fall and winter have prevented an active search service promotional campaign.

Although frequent training activities have been well-attended and the number of affiliates has been increasing steadily, the amount of revenue from services has not been enough to ensure that the NASIC program will be self-supporting. The initial planning did not, for example, adequately anticipate all costs involved with training such as communication, manuals, workbook compilation, vendor staff travel expenses and workshop meals. During the fall a half-time secretary had to be added to the program to assist with the workload generated by training workshops. Additionally, NASIC fees are low for the services provided in comparison with similar charges made by commercial vendors. To recoup the actual staff time devoted to workshop preparation, organization and performance, the workshop and staff fees ought to be higher. However, an increase over 50 percent would probably have affected the extent and amount to which libraries would have used NASIC services. The program has already observed a noticeable decrease in requests by affiliates for follow-up training and end-user demonstrations. While travel costs are one factor, it seems more likely that most libraries are currently emphasizing workshop introductory

training and foregoing the extra expense of on-site individualized instruction or frequent demonstrations as a means to promote their service. Whereas the NASIC staff would have visited each campus after a workshop or participated in two or more demonstrations per year during the grant period, NASIC staff are now conducting on-site follow-up training or demonstrations far less frequently. These various factors all point to the need for a restructuring of NASIC's charges for services, including a probable new setting of the affiliation fee in order to take into account the variety of libraries which are eligible for affiliate status: graduate research library, undergraduate library, special library, consortium or dual membership. A particular problem exists, of course, in the case of special libraries which are part of such affiliates as the Polaroid Corporation or Digital Equipment Corporation.

At the same time, the program has perceived a need for NASIC-type services by a particular type of library -- that serving an undergraduate liberal arts college. Motivated by the cost-effective aspects of on-line searching as a complement or substitute for the printed indexing or abstracting product, several such libraries have contacted NASIC to discuss the costs of initiating on-line searching capability.

While a few smaller academic institutions have participated in NASIC for some time, it is believed that if additional administrative consultation and on-campus training could be made available, more libraries might be able to become involved with the provision of on-line searching. To that end, NEBHE submitted

a proposal to a private foundation for provision of some consultative and training support to small college libraries which were interested in participating in the NASIC program. The initial outline was submitted in the spring of 1976 and elicited a response to expand the proposal outline to a complete proposal. The proposal was forwarded in early fall with the expectation that, if granted, additional professional staff would have to be hired for the program. Unfortunately, in late Janaury, the foundation concluded that it would be unable to fund the proposal.

Realizing that NASIC will have to restructure and increase its affiliate and service fee schedule for the next year, NEBHE urged that an Advisory Committee Meeting be convened. At that time, the operational and service goals can be reviewed with some of the library administrators from active affiliates. In addition to developing other types of training functions which are needed by affiliates, the NASIC program must elicit some opinion from the libraries as to how much or in what manner they can pay for program services. At the same time, NASIC will explore the desirability of group contracts with the other vendors who are now offering such plans.

CONCLUSION

Although not an experiment in the formal scientific sense, NASIC should be evaluated as an experimental entity rather than as one might evaluate a commercial enterprise, despite the fact that a self-supporting program was one of the aims of the project. Even though NASIC did not achieve self-supporting status by the time the financial support from the National Science Foundation had terminated, the NASIC "experiment" provides an interesting case history for the role of an intermediary in the provision of technology-based services.

The technological component of the NASIC experience is an important factor in understanding the outcome of the program. The progression from the local or regional off-line tape spinning services that constituted the premise for establishing NASIC to the national and international networks of on-line search services that exist only four years later created an environment in which constant change and updating of programs and materials was essential.

NASIC's early access to the resources and expertise of the staff of the MIT Libraries and Electronic Systems Laboratory provided a good base from which to meet these technological challenges, and the program attained some very real successes in its effort to bring advancing technology to its participants. Most prominent was the effective training of Information Services Librarians at almost all of the major academic institutions in the Northeast. Also notable was the development of training,

administrative, and reference materials, the latter two of which received distribution well beyond the community of direct participants. Of particular importance were the reference materials which served as models and, in some cases, major components for similar materials later developed by the commercial search service vendors.

The environment in which NASIC marketed its services is also an important factor in understanding the history of the project. NASIC had the advantage of being able to build upon the multi-institution and multi-state experience and reputation of NEBHE and its NELINET activity and organization. The perception by academic librarians in the region that NASIC was complementary to the existing successful undertakings of NELINET paved the way for an effective educational and marketing effort by the NASIC staff in the academic library community.

On the other hand, NASIC was created at a time when the financial condition of higher education, and particularly of academic libraries, was weak and becoming more precarious. The budget problems faced by the academic library community made it extremely difficult for them to maintain existing library services and severely constrained their ability to introduce any new services, let alone data base searching which was not a replacement service but required an additional investment in equipment, materials and especially staff time.

The ongoing costs of the data base services themselves added to the difficulties faced by NASIC. Academic libraries had little experience -- and in many cases were uncomfortable --

with the concept of charging users directly for services provided. Also, the tight fiscal position of the university as a whole made it difficult for the academic administration to support or subsidize on an ongoing basis the provision of computer-based search services. Finally, research support from the government and private sources declined during this period, making it more difficult for individual faculty members or students to underwrite the cost of obtaining search services.

The financial problems facing academic libraries and their parent institutions also affected their ability and willingness to underwrite NASIC on a continuing basis. The rates set by NASIC for affiliation and service fees for 1976-77 were substantially below the actual costs of program operation, an arrangement that was feasible only because of sufficient remaining funds from the Foundation grant to support the program for the first few months of the budget year and because of the willingness of NEBHE to underwrite any operating deficits that might occur during that year. Even with these reduced fees, there has been a reluctance on the part of participating institutions to use NASIC services fully, particularly the $125-per-day consulting services at the affiliate's location.

During the 1976-77 NASIC effort at achieving a status close to self-support, the program eliminated the requirement that only non-profit academic institutions be allowed to participate in the program. It was hoped that this move would stimulate the affiliation of a large number of actual or potential search service users in the industrial and commercial sectors,

particularly users located within a reasonable driving distance of the NEBHE offices in Wellesley. Because for-profit organizations were not so limited in their financial resources, and because they have had a long tradition of purchasing information and related consulting services, and finally because the *NASIC Search Aids* had been so well received and widely subscribed to by the corporate sector, the NASIC staff anticipated that the program could count on affiliation by as many as twenty non-academic libraries in the early months of the 1976-77 budget year and perhaps more as information regarding non-academic eligibility for participation became widely disseminated.

The fact that a significant number of corporate affiliations did not materialize was a major disappointment as the program attempted to be self-supporting. In retrospect, this absence of corporate response is not so surprising, given that the non-academic information community had limited awareness, other than their familiarity with the *NASIC Search Aids*, of the experience and expertise of NASIC and NELINET in the area of application of technology to library operations. And those who were aware of the activities of the two programs had long been under the impression that NEBHE's activities were limited to the academic sector. Thus, any effective program of recruitment of corporate affiliates for NASIC would have required an extensive effort of education and marketing in the non-academic sector, an effort for which the existing NASIC staff had little time. Moreover, there were no resources available to obtain the additional staff and talent necessary for such an effort.

A further obstacle to NASIC's ability to recruit affiliates and to sell its services was related to the role of the broker in the provision of information services. To a great extent, NASIC was forced to compete with the commercial search service vendors whose services NASIC wished to broker. Each of the vendors offered its own training and education services and could not relinquish such services in favor of an intermediary such as NASIC, which provided similar services for competing vendors. And NASIC, as a program of a government agency, was precluded from becoming the marketing or training representative of just one vendor. In addition, it was only with the entry into the field of BRS, Inc. as a major competitor to Lockheed and SDC that there arose the possibility of financial benefits for a user to employ a broker to obtain on-line search services. Thus, even though NASIC had generally comfortable and successful working arrangements with each of the four major vendors, or perhaps because NASIC was required to work with any interested major vendor, it was impossible to develop the kind of middleman operation that would enable the program to support itself on income generated through the sale of search services.

One area in which NASIC did demonstrate some self-sufficiency was that of the direct provision of search services on a retail basis, through NASIC CENTRAL operation. This operation had been established originally to assist the NASIC staff members in maintaining their searching skills and to provide them with experience in dealing with actual users as well as to make search services available to academic users at Boston area

institutions that, either because of lack of interest or demand, did not have local searching capabilities. Marketing retail search services to such a widely dispersed audience is a difficult and time-consuming task, particularly when the potential customers must be educated as to the utility of the services and persuaded of the worth of purchasing information services. It is not surprising, therefore, that many of the users of NASIC CENTRAL were from commercial firms, which were willing to cover the cost of the search services, notwithstanding the fact that fees for such users were 50 percent higher than for academic users. However, a regional retail search service was contrary to the goal of NASIC to assist in the implementation of a local service capability.

While the NASIC CENTRAL search operation did cover its costs and produce a small surplus, it constituted only a minimal portion of NASIC activity. In order for this operation to have made a substantial contribution to NASIC's financial well being, it would have had to be vastly expanded with a heavy emphasis on marketing to the commercial and industrial community in the Boston metropolitan area. This kind of effort would have required a willingness on the part of NEBHE to commit substantial resources to a marketing effort for what would be, in effect, a retail commercial activity. But neither the commercial activity nor the required emphasis on the for-profit sector coincides with the charter of NEBHE as an agency dedicated to cooperative activities among the New England institutions of higher education nor with its status as a not-for-profit organization. To

provide retail services as a corollary activity for the benefit of its surrounding community was acceptable, but to make such services a major emphasis of the program was not appropriate for NEBHE or any similar organization.

In sum, NASIC was a program with considerable success. It had a significant impact in increasing the awareness of the academic research and information communities, both in the Northeast and across the country, as to the utility of computer-based bibliographic information services. The program provided substantial assistance to libraries in the process of initiating search services, through training, administrative consultation and user education, and created a sufficiently firm foundation for these local services to continue if NASIC ceases operation. The staff also produced materials, particularly the *NASIC Search Aids*, which were of great utility to the information community across the country and provided a model that both data base producers and search system vendors have used in developing or modifying their own user materials. Finally, NASIC played an important role in making the search system vendors aware of the unusual circumstances and requirements of the non-profit users of information services and had some impact in the modification of contract and pricing arrangements, as well as user services, which made on-line searching more accessible to the academic community.

The major obstacle of NASIC has been, of course, in the area of finances. An ongoing intermediary activity would require a staff of at least three and preferably four professionals, and NASIC has not even been able to support a staff of

two on a self-supporting basis. The reasons for this financial situation are many: the tremendous resources required to keep pace with a rapidly changing set of services, the deteriorating financial position of universities and academic libraries, the problems in developing a broker relationship with multiple vendors that would enable the middleman to generate revenues in proportion to the quantity of search services utilized by the retail customers, and the inappropriateness of NEBHE as a marketing organization and particularly as a seller of services to the private for-profit sector. The realities of the financial situation dictate that a continuing NASIC operation, after the 1976-77 fiscal year, will be dependent on the interest of NEBHE to subsidize the operation for the benefit of its constituent community as well as the willingness of the affiliates to more fully underwrite the costs of the program services.

But even the inability of NASIC to develop a self-supporting capacity should not be viewed as a failure of the experiment initiated by NEBHE and the National Science Foundation. A major component of that experiment was to determine whether an intermediary activity in the computer-based information field is a viable operation. NASIC has demonstrated that there is a potential role for an intermediary organization and that the user community is willing and finds it useful to work through an intermediary organization. In addition, NASIC has demonstrated the difficulty of even an accepted and successful intermediary organization becoming self-supporting and points out the many constraints and obstacles inherent in the development of an intermediary role.

Even at this time, the future status of the NASIC program is still under assessment. At a recent meeting of the NASIC Advisory Committee, the members were most enthusiastic and supportive about the continuation of NASIC. However, the type of program desired -- a variety of training sessions and administrative workshops, more publications and increased marketing efforts -- demands a minimum staff of four professional people. As both the present staff members of NASIC will be leaving in June and no continuity is anticipated, the staffing situation presents immediate problems. While the Committee members expressed willingness to underwrite more of the costs of the program in terms of higher affiliation, workshop and NASIC staff fees, a budget for even the minimum, rather than the recommended, program would still require a substantial subsidy by NEBHE.

At the suggestion of an Advisory Committee member, institutions which have participated in the NASIC program over the past few years or months have been invited to provide some observations and comments. The responses received by April 28, 1977 have been included in Appendix C. Although a consensus has not yet been reached about the future operation of the NASIC program, the recommendations of the Committee and the positive appraisal reflected in the letters endorse the outstanding achievements of NASIC, past and present.

APPENDIX A

SAMPLE PAGES EXTRACTED FROM A NASIC DATA BASE PRESENTATION

ISMEC

* DIALOG File 14

* Currently contains 58,000 citations with monthly updates of 1,400 records

* Coverage from January 1973

* Connect time: $45/hour
  10¢/any format printed off-line

* Recently acquired by Data Courier, Inc.
  620 South Fifth Street
  Louisville, Kentucky 40202

PRINTED RECORD

ISMEC

DIALOG SYSTEM

```
?
10748   D7403254
  OFFSHORE   OIL   AND   GAS   (PRODUCTION):  THE  FUTURE  ENGINEERING
CONTRIBUTION
  ALLCOCK,  L.C.     ;  SHELL  EXPLORATION AND PRODUCTION LTD.,  LONDON,
ENGLAND
  CHART.  MECH.  ENG.  (GB)   VOL.21  NO.1   47-51   JAN. 1974   CODEN:
CHMGAF
  DESCRIPTORS: OIL EXTRACTION, GAS EXTRACTION
  IDENTIFIERS: DEVELOPMENT, OFFSHORE OIL AND GAS PRODUCTION
  SECTION CLASS CODES: D7500
```

ISMEC BULLETIN PUBLICATION

7.000 MECHANICAL ENGINEERING AND NATURAL RESOURCES

7.100 AGRICULTURAL ENGINEERING

(for tractors see 6.750)

3250 **Development of a high-performance hot-air drier for green fodder.** Chi v Zabeltitz (Tech. Univ., Hannover, Germany). *Verfahrenstechnik (Germany)*, vol.7, no.12, p.363-7 (Dec. 1973). In German. (no refs.)

7.300 MINING

3251 **From mining to processing [raw materials, mining equipment].** *Fordern & Heben (Germany)*, vol.23, no.18, p.46-61 (Dec. 1973). In German. (no refs.)

3252 **Opencast mining [developments in Poland].** J Pilecki. *Pol. Tech. Rev. (Poland)*, no.6, p.25-9 (1973). [received: Jan. 1974] (no refs.)

3253 **Stress and strain analysis of a colliery detaching hook.** A.O Taylor (Newcastle Teachers Coll., N.S.W., Australia); A.J Carmichael. Conference on Stress and Strain in Engineering, Brisbane, Australia, 23-24 Aug. 1973. (Sydney, N.S.W., Australia: Instn. Engrs.), Australia 1973), p.176-82 (4 refs.)

7.500 OIL AND NATURAL GAS

3254 **Offshore oil and gas [production]: the future engineering contribution.** L.C Allcock (Shell Exploration & Production Ltd., London, England).
Chart. Mech. Eng. (GB), vol.21, no.1, p.47-51 (Jan. 1974). (no refs.)

3255 **Practice of oil depot automation.** A Sawakata, Y Hayakawa, M Kobayashi, T Nagawa (Tokyo Shibaura Electric Co. Ltd., Japan). *Toshiba Rev. (Japan)*, vol.23, no.10, p.1135-9 (1973). In Japanese [received: Jan. 1974] (no refs.)

ISMEC

BASIC INDEX - SINGLE AND MULTI-WORD TERMS EXTRACTED FROM DESCRIPTOR, IDENTIFIER AND CORPORATE SOURCE FIELDS.

```
? ESOIL
Ref   Index-term                    Type  Items  RT
E1    SOGENIQUE----------------            1
E2    SOGENIQUE MACHINE TOOL
        CALIBRATOR-------------            1
E3    SOGICOMS-----------------                 1
E4    SOHN---------------------            5
E5    SOHR---------------------            1
E6  -SOIL----------------------           34   5
E7    SOIL BEARING-------------            1
E8    SOIL MECHANICAL FACTORS--            1
E9    SOIL MECHANICS-----------            3
E10   SOIL MECHANICS ANALOGY---            1
E11   SOIL PENETRATION---------            1
```

```
? EE6
Ref   Index-term                    Type  Items  RT
R1  -SOIL----------------------           34   5
R2    EARTH (SOIL)-------------F           1
R3    MATERIALS----------------B        2181  38
R4    MATERIALS----------------T        2181  38
R5    NATURAL RESOURCES--------R           3   8
R6    POROUS MATERIALS---------R          35  12
```

ON-LINE THESAURUS DISPLAYS THE CONTROLLED SUBJECT HEADINGS USED IN DESCRIPTOR FIELD; UNTIL THE THESAURUS BECOMES PUBLICLY AVAILABLE, CONSULT THE SEMI-ANNUAL SUBJECT INDEX TO THE PRINTED ISMEC BULLETIN WHICH REFLECTS THE CONTROLLED VOCABULARY TERMS. OR, USE THE DIALIST FOR ISMEC STRATEGY PREPARATION.

THE IDENTIFIERS ARE ADDITIONAL FREE TERMS ASSIGNED BY ISMEC FOR TITLE AND SUBJECT ENHANCEMENT.

ISMEC

Section Classification Codes (SC=)

A 5-digit subject area code which corresponds to the hierarchical classification used for the ISMEC Bulletin. Useful as another subject access point, refer to the code list on next page. More than one section classification code may be assigned to each citation (they appear as cross references in the printed products).

Convert the code 7.500 (oil and natural gas) to

SELECT SC=D7500 when inputting on-line:

```
E SC=D7500
Ref   Index Term              Type Items Pt
E1    SC=D6770                      201
E2    SC=D6780----                  264
E3    SC=D6790                      640
E4    SC=D7100                       90
E5    SC=D7200                      200
E6    SC=D7500                      399 -   OIL AND NATURAL GAS
E7    SC=D7000                      111
E8    SC=D7010                      426
E9    SC=D7800                      324
E10   SC=D7801                      380
E11   SC=D7802                      290
E12   SC=D7805                      154
E13   SC=D7836-                     242
E14   SC=D8000                        1
```

The codes are not cascaded; however, truncation can be used to retrieve all relevant categories:

SELECT SC=D78? for all ecology subsections

ISMEC

Journal Title (JN=)

OR

Coden (CO=)

Source list is available in Lockheed Vol. II Manual (Appendix P); however, abbreviations are not included. Refer to INSPEC List of Journals (1977) for certain ISMEC journal title abbreviations or EXPAND on-line:

```
? S JN=WELDING ENGINEER
          8      0 JN=WELDING ENGINEER
? E JN=WELD. ENG.
Ref   Index Term                    Type Items PT
E1    JN=WASSER. LUFT AND
        BETR. (GERMANY)--------        121
E2    JN=WATER POWER (GB)------         69
E3    JN=WERK (SWITZERLAND)---         450
E4    JN=WELD RES. INT. (GB)--           3
E5    JN=WELD. AND MET. PREP.
        (GB)-------------------        180
E6  * JN=WELD. ENG.
E7    JN=WELD. ENG. (USA)-----         77 - Welding Engineer
E8    JN=WELD. J. (USA)-------        175
E9    JN=WELD. RES. (USA)-----        141
E10   JN=WELD. RES. INT. (GB)-         20
E11   JN=WELD. WORLD (GB)-----         48
E12   JN=WELD. J. (USA)-------          8
E13   JN=WELDING LOW TEMPERATU
        RE CONTAINMENT PLA----         26
```

Or, use Coden (CO=) appearing in INSPEC List or ASTM (if using the latter, eliminate hyphen and truncate after the fifth character).

```
? E CO=WEEGA4
Ref   Index Term                    Type Items PT
E1    CO=WAFOAL                        60
E2    CO=WAGIAI                        20
E3    CO=WCHNA?                        14
E4    CO=WIWRAI                        48
E5    CO=WERRAM--------------         451
E6    CO=WEEGA4                        77 - Welding Engineer
E7    CO=WEJURO--                     175
E8    CO=WERSAC--------------          12
E9    CO=WLBBAM--------------         121
E10   CO=WLMFAM--------------         180
```

ISMEC

LANGUAGE (LA=)

LANGUAGE FIELD IS ONLY INCLUDED FOR THOSE CITATIONS OF DOCUMENTS WRITTEN IN A FOREIGN LANGUAGE OR BOTH ENGLISH AND OTHER LANGUAGE(S).

```
E6   -LA=----------------------
E7    LA=AND-------------------        9
E8    LA=CROATIAN--------------       27
E9    LA=CZECH-----------------        4
E10   LA=DUTCH-----------------      106
E11   LA=ENGLISH---------------       92
E12   LA=FLEMISH--------------        2
E13   LA=FRENCH---------------      279
E14   LA=GERMAN-----                4127
E15   LA=GERMANY                      2
                                   -MORE-
? P
REF   INDEX TERM                TYPE ITEMS RT
E16   LA=GREEK                          3
E17   LA=HUNGARIAN                     14
E18   LA=ITALIAN                       25
E19   LA=JAPANESE----------          2051
E20   LA=POLISH                        16
E21   LA=RUMANIAN                      49
E22   LA=RUSSIAN                       58
E23   LA=SLAV                           5
E24   LA=SLAVONIAN                      3
E25   LA=SLOVENIAN                     33
E26   LA=SLOVIAN                        7
E27   LA=SWEDISH-                       6
```

THE MAJORITY OF ISMEC CITATIONS REPRESENT ENGLISH ARTICLES.

ISMEC

Abstract Number, Standard Book Number, or U.S. Government Report Number (RN=)

To retrieve a particular ISMEC abstract number, enter

SELECT RN=DYRnnnnn

```
? SRN=D7301317;T5/5
      5      1 RN=D7301317

1
1317   D7301317
  ON A FINITE STRAIN THEORY (WITHIN THE FRAMEWORK OF THERMODYNAMICS)
OF ELASTIC-INELASTIC MATERIALS
  KRATOCHVIL, J.  ; INST. SOLID STATE PHYS., PRAGUE, CZECHOSLOVAKIA
  ACTA MECH. (AUSTRIA)  VOL.16, NO.1-2  127-42  1973  CODEN:
AMHCAF
  DESCRIPTORS: MATERIALS, STRAIN, THERMODYNAMICS
  IDENTIFIERS:  FINITE  STRAIN  THEORY,  INELASTIC  BEHAVIOUR  OF
CRYSTALLINE MATERIALS, ELASTIC INELASTIC MATERIALS
  SECTION CLASS CODES: D3210
  (23 REFS)
```

OR, TO RETRIEVE AN ISBN NUMBER:

```
1     52 RN=3871553314

24436   D7501801
  ELECTRON-BEAM WELDING OF SOME SPECIAL COMPONENTS (VACUUM-TIGHT
CONTAINERS) FOR IRRADIATION-EXPERIMENTS AND FOR UF/SUB 6/-TECHNOLOGY
USING RARE MATERIALS
  MAYER, H.G., KOEPPE, A.
  ; GERMAN WELDING SOC
  STD BOOK NO.: 3 87155 331 X
  2ND INTERNATIONAL COLLOQUIUM ON WELDING IN NUCLEAR ENGINEERING
135-8  1974
  23-24 OCT. 1974  GERMAN WELDING SOC  DUSSELDORF, GERMANY
  PUBL: GERMAN WELDING SOC.  DUSSELDORF, GERMANY
  DESCRIPTORS: ELECTRON BEAM WELDING, CONTAINERS, VACUUM APPARATUS
  IDENTIFIERS:  ELECTRON  BEAM  WELDING,  IRRADIATION  EXPERIMENTS,
MANUFACTURE, VACUUM TIGHT CONTAINERS, STAINLESS STEEL, AL ALLOYS, MO,
V, NI, AG, AGCL, CONSTRUCTIONAL DESIGN, UF/SUB 6, RARE MATERIALS
  SECTION CLASS CODES: D8100, D4510, D5560
  LANGUAGE: GERMAN
  (3 REFS)
```

APPENDIX B

SAMPLE QUICK REFERENCE CHART AND NOTES
EXTRACTED FROM

NASIC SEARCH AIDS

ORBIT "FILE CIS INDEX"

NASIC QUICK REFERENCE CHART
1970 to present

FEATURES	CODE OR COMMAND	COMMENTS
SEARCHABLE FIELDS		
Main Title	(MTI) → (FT)	(FT) contains single words extracted from MTI, MA, TY, MIT, AIT, WI, and FW fields; (IT) contains single- and multi-word controlled vocabulary terms assigned by CIS; (WT) contains full names: last name first, generally followed by first name and initials, "NBR" to check variations; (FW) is a subset of (WI) — Primary subject search fields
Main Abstract	(MA) → (FT)	
Testimony Abstract	(TY) → (FT)	
Main Index Terms	(MIT) → (IT)	
Analytic Index Terms	(AIT) → (IT)	
Witness(es)	(WI) → (WT)	
First Witness	(FW) → (WT)	
Accession Number	(AN)	The complete AN and the EY, SO, CC, DT parts of it are separately searchable, e.g. 74 — S 36 1 — 24.1 (EY; SO; CC; DT; Volume No.; Analytic No.)
Entry Year	(AN) (EY)	Search EY using date ranging, see LIMITS (over).
Source Code	(AN) (SO)	Search SO using codes: S=Senate, H=House, J=Joint, PL=Public Law
Committee Code	(AN) (CC)	To search CC, check listing*
Document-Type Code	(AN) (DT)	To search DT, check listing* and include (DT) with the no.
Congress and Session Number	(CS)	3-digit hyphenated code, e.g., 94-1 is 1975 session; truncate to retrieve both sessions.
Citation to Statutes at Large	(CI)-(CL)	For Public Laws only, e.g., 88 STAT. 2333.
Superintendent of Documents/Item Nos.	(SI)	Separately searchable; enter with punctuation; disguise colon with #.
Document/Report Nos.	(NU) or (MIT) → (IT)	Enter with punctuation and spacing, e.g., H. RPT. 93-1003
Issue Code	(IS)	4-digit code corresponding to each monthly printed CIS/Index; use as Update Code.

*in SDC/CIS Manual

Continued

The information presented here is derived from materials published by SDC Search Service, System Development Corporation, Santa Monica, California.

ORBIT "FILE CIS INDEX"

NASIC QUICK REFERENCE CHART
1970 to present

FEATURES	CODE OR COMMAND	COMMENTS
FIELDS NOT DIRECTLY SEARCHABLE		
Main Reference	(MRE)	To search these fields use STRS on a previously retrieved SS.
Analytic Reference	(ARE)	
Availability	(AV)	
Monthly Catalog/ Lib. of Cong. Nos.	(MCLC)	
Record Size	(RS)	
Analytic Record Size	(ARS)	
LIMITS		
to entry years	AND FROM YR THRU YR AND GREATER THAN YR AND LESS THAN YR	Use with term or SS (YR=last 2 digits of year).
PRINT FORMATS		
ON-LINE *standard*	"PRT"	AN, MTI, MRE, AV, IS, CS, SI, MCLC, NU, CI, RS, ARE, ARS, FW
standard	"PRT TRIAL"	AN, MTI, MIT, IS, RS, ARE, ARS, AIT, FW
standard	"PRT FULL"	Full Citation (includes Main Abstract and Testimony Abstract)
standard	"PRT FULL INDENTED"	Full Citation with word descriptions of fields; do not use with keywords below.
tailored	"PRT XX,YY,..."	XX=any field code; YY=any field code
		Use to print information from:
tailored with keyword	"PRT MAIN..."	Main: X
tailored with keyword	"PRT NOMAIN..."	Hit-producing Analytics: X
tailored with keyword	"PRT COMPLETE..."	All Other Analytics: X
tailored with keyword	"PRT ANALYTICS..."	Hit-producing Analytics: X; All Other Analytics: X
OFF-LINE *standard or tailored*	"PRT...OFF-LINE"	Include OFF-LINE in any of the above PRT commands without keywords.
cancellation	CANCEL	Respond CANCEL to system question after PRT OFF-LINE has been entered.
ON-LINE DOCUMENT ORDERING		
microfiche copies	"ORFER CISFICHE"	For subscribers who have a deposit account with CIS; use while connected to ORBIT data base.

SS=Search Statement

Points to Remember About Searching

ORBIT CIS INDEX

1. Data Base Related

The CIS INDEX or CIS data base corresponds to the printed CIS/Index which encompasses the following types of congressional publications: Committee Hearings, Committee Prints, House and Senate Reports, House and Senate Documents, House and Senate Special Publications, Senate Executive Reports, Senate Executive Documents, and Public Laws.

Committee Hearing publications cannot be described in the normal data base format of a single record containing bibliographic information and a summary of the publication's nature and subject matter. Each Hearing document includes a Main record which provides basic bibliographic data for the document as a whole and an overall summary of the hearing. Each Main record is followed by individual Analytic records that summarize separate items of testimony.

CIS also publishes the CIS/Annual which is a cumulation of all the abstracts issued during the year and includes full-indexed legislative histories for Public Laws enacted during the year, and any additional bibliographic data about the year's congressional publications which was not available at the time monthly issues and tapes were prepared. This Public Law and bibliographic information is also added annually to the on-line data base.

CIS uses a controlled vocabulary to assign subject index terms and, in general, indexes to specific rather than to general terms wherever possible. Because the controlled vocabulary in use at CIS is not published separately, the searcher must consult the Index of Subjects and Names of a CIS/Annual during strategy development. Acronyms and abbreviations are used by CIS and should be considered by the searcher for inclusion in the strategy.

Continued

The information presented here is derived from materials published by SDC Search Service, System Development Corporation, Santa Monica, California.

2. ORBIT Related

The SDC implementation of the CIS data base creates three basic subject-related fields. The Index Term (IT) field contains only single- and multi-word controlled vocabulary terms assigned by CIS to Main and Analytic records. The Witness (WT) field contains complete names, last name first, of all witnesses (WI) including first witnesses (FW) who have testified at a congressional hearing. The Free Term (FT) field is computer-created and contains only single words extracted from the Main Title (MTI), Main Abstract (MA), Testimony Abstract (TY), as well as the (IT) and (WT) fields.

For most searches the retrieval strategy will probably include both controlled vocabulary and free-language terms. The searcher should routinely enter ALL with any single-word term to avoid the Multi-Meaning Message indicating that the term exists in the (IT) and (FT) fields. Some Index Terms contain the logical operators AND or OR, or other words which have special uses in ORBIT such as ALL or GREATER. When these are present in a term to be used in the strategy they must be disguised by substituting the Variable Character for one of the letters in the word, e.g., PUBLIC A#D ALLIED HEALTH PERSONNEL ACT or AL# INDIAN PUEBLO COUNCIL.

If a search includes a restriction by Document Type, the field code (DT) must be entered with the number so that ORBIT does not interpret it as a Search Statement number.

Stringsearch can be used to minimize the likelihood of false retrievals on common words when the strategy consists primarily of single-word free terms. A Search Statement is created by ANDing the common words. Then the (MA) and (TY) fields of the citations retrieved by this Search Statement are Stringsearched for the exact concept phrase.

To aid the searcher in determining appropriate PRINT formats, SDC has created the Record Size (RS) and the Analytic Record Size (ARS) fields.

APPENDIX C

LETTERS FROM NASIC INSTITUTIONS

NEW ENGLAND BOARD OF HIGHER EDUCATION

NASIC
NORTHEAST ACADEMIC
SCIENCE INFORMATION CENTER

April 15, 1977

Dean George R. Parks
University Libraries
University of Rhode Island
Kingston, RI 02881

Dear Mr. Parks:

At a recent meeting of the NASIC Advisory Committee, the members had an opportunity to review the draft version of the final Technical Report being submitted to the National Science Foundation by the New England Board of Higher Education. It was suggested by one of the members that former NASIC institutions and present affiliates might wish to provide some comments about the NASIC program.

If you are interested in responding, we would appreciate receiving your letter by April 28, 1977. We are preparing the final version of the Report for publication, and all comments received by that date would be included within an Appendix.

Sincerely,

Patricia E. Vaughan
Coordinator of NASIC Program

40 GROVE STREET, WELLESLEY, MASSACHUSETTS 02181 (617) 235-8071

The Charles Stark Draper Laboratory, Inc.
555 Technology Square, Cambridge, Massachusetts 02139 Telephone (617) 258-

April 27, 1977

COMMENTS ON NASIC PROGRAM

NASIC programs are very beneficial to libraries offering on-line search services. NASIC training is excellent; as new vendors and data bases come on the market it continues to meet an important need. As a broker NASIC has promoted good relationships with vendors, and has offered a significant discount with one vendor. NASIC sponsored meetings and workshops have facilitated communications among member libraries.

Draper Laboratory Library

Hampshire College
Amherst, Massachusetts / 01002

Library Center
26 April 1977

Patricia E. Vaughan
Coordinator, NASIC
40 Grove Street
Wellesley, Massachusetts 02181

Dear Pat,

Although Hampshire College is a relative newcomer to NASIC, I'm delighted to have an opportunity to comment on the value of our affiliation with the program. Hampshire is a new small college with limited resources; we have never acquired some of the traditional standard reference tools. Access to automated information retrieval systems not only augments the resources of our reference collection, but also fits in a special way into the general program of reference and information services we have designed to serve our community.

Hampshire places a heavy emphasis on undergraduate independent study, from first year course-related projects to the final thesis. In the past, we often had to refer students to other libraries to use backfiles of indices and abstracts, or watch their crestfallen looks as they contemplated browsing through a decade of abstracts. Since our reference staff have attended NASIC training sessions, I believe that they have acquired both a new skill in information retrieval, and a more precise grasp of search strategies in general. Because NASIC has made training affordable for us, we are now able to contemplate both expansion and replacement of existing reference services.

As I mentioned earlier, our association with NASIC is new, and we have only begun to tap the resources available in introductory and advanced training sessions. But the prospects which are emerging as our staff become aware of new approaches to and possibilities for service to faculty and students are truly exciting.

Sincerely,

Gai Carpenter
Director
Harold F. Johnson Library Center

A Voluntary Referral Network
For Data Base Searching
Through Area Libraries

SEARCH SITE LIBRARIES:

Kansas
Johnson County
Public Library
(913) 831-1550

Kansas City
Public Library
(913) 621-3073

University of Kansas
Medical Center
Clendening Library
(913) 588-7166

Missouri
Kansas City
Public Library
(816) 221-2685

Mid-Continent
Public Library
(816) 836-5200

St. Luke's
Medical Library
(816) 932-2333

University of Missouri-
Kansas City
General Library
(816) 276-1534
Medical Library
(816) 474-4100
Ext. 280

Kansas City Libraries
METROPOLITAN
INFORMATION
NETWORK

(816) 276-1531

April 22, 1977

NASIC Advisory Committee
New England Board of Higher Education
40 Grove Street
Wellesley, Massachusetts 02181

Ladies and Gentlemen:

I am aware that you have had an opportunity to review the draft version of the Final Technical Report being submitted to the National Science Foundation by the New England Board of Higher Education. As an affiliate of the NASIC program, I think this might be an opportune time to make some observations.

The Kansas City Libraries Metropolitan Information Network is a voluntary referral network for data base searching through eight area libraries. The Kansas City metropolitan area covers Johnson and Wyandotte Counties in Kansas and Jackson, Clay, and Platte Counties in Missouri. The eight libraries where on-line searching is being offered to citizens on a cost-recovery basis are a mix of academic, public, special, and health science libraries. The network has been operational since January 31, 1977.

Twelve months ago the Missouri State Library provided the Metropolitan Information Network with a grant of $18,845 for the in-service training of seventeen librarians to man the network referred above. While the grant proposal was being drafted, we had contact with Ms. Patricia Vaughan, Coordinator of the NASIC Program, and indicated our interest in affiliating with NASIC and using her services and those of her staff throughout the period of planning and implementation of the training program for the network.

Kansas City is a long way from New England. However, we have been able to maintain close contact with the NASIC office throughout this period.. We

have found the response to our needs prompt and efficient. Between September, 1976 and March, 1977 nine training sessions for the on-line searchers plus two additional training sessions for librarians in the metropolitan area who do not search on computer but need to have a proper orientation, were planned and conducted by the NASIC staff or by trainers they recommended. Both the consultive and training aspects of the NASIC program has proven to be extremely helpful.

The training materials which have been provided have been consistently of a high quality. The representation that the NASIC office affords us as an affiliate on user boards of data base vendors such as Bibliographic Retrieval Services is an additional service which we hope to continue to enjoy.

The library administrators of the search site libraries, the librarians who have been trained as searchers, and I as project director feel that our money has been well invested in the services which NASIC provides. It would be our hope that these services would continue and would be more heavily represented here in the heart of America.

Sincerely,

T. Philip Tompkins

T. Philip Tompkins
Associate Director of Libraries
Project Director

TPT/vp

The Commonwealth of Massachusetts
University of Massachusetts
Worcester 01605

MEDICAL CENTER LIBRARY
55 Lake Avenue North

Telephone: (617) 856-2368

April 25, 1977

Ms. Patricia E. Vaughan
Coordinator of the NASIC Program
New England Board of Higher Education
40 Grove Street
Wellesley, Massachusetts

Dear Ms. Vaughan:

For your information, we found the NASIC program on the use of computerized data bases to be very useful. It kept us up-to-date on the large number of data bases that are continually becoming available and provided us with a central agency through which we could receive information and handle billings related to all of them. The personnel at NASIC have always been exceptionally cooperative and knowledgeable and have had a major influence on the development of computerized searching in New England.

We hope that some way will be found to enable the NASIC group to resume this worthwhile service.

Sincerely,

Donald J. Morton

Donald J. Morton, Ph.D.
Library Director

DJM/gl

An Equal Opportunity Employer

PLYMOUTH STATE COLLEGE
OF THE
UNIVERSITY OF NEW HAMPSHIRE
PLYMOUTH, NEW HAMPSHIRE 03264

HERBERT H. LAMSON LIBRARY

603-536-1550 Ext. 257

April 20, 1977

Ms. Patricia E. Vaughan
Coordinator of the NASIC Program
New England Board of Higher Education
40 Grove Street
Wellesley, Massachusetts 02181

Dear Pat:

I would like to respond to your request for comments about the NASIC program. However, without a copy of the draft version of the final technical report being submitted to the National Science Foundation, it is extremely difficult to know the kinds of input you are seeking.

We consider the relationship to NASIC to be extremely important and have no wish to deal directly with any of the information service vendors. This probably reflects the limited use we have made of these services to date. It also reflects the simplification and convenience for which we are willing to pay by working through NASIC or a similar agent. Although our use has been limited, we have no wish to discontinue our ability to offer it to users who need it. Those who have used it have been very pleased and most appreciative. We currently are attempting another type of information dissemination about it to our faculty, many of whom are still uneasy about it.

Personally I am very disappointed that NASIC has not become a program of NELINET and foresee continued growing overlap of interest in the two programs. I strongly support NASIC and urge that it not be discontinued, while at the same time strongly recommend that its "home" be shifted from NEBHE to NELINET.

We further look forward to the time when NASIC can facilitate direct access by users to the many data bases. The present arrangement of having to work through a library staff searcher can be discouraging and in some instances it works to the detriment of the search. I see direct access as the next natural step in the NASIC program.

I would be happy to talk to you about this if you wish to call me before April 28. I am not sure if Bob McDermand's response would be the same as mine, but since he is on sabbatical leave currently he is unable to speak for himself.

Very sincerely yours,

Janice Gallinger

Miss Janice Gallinger
College Librarian

JG/paw

UNIVERSITY LIBRARY TUFTS UNIVERSITY MEDFORD MASSACHUSETTS 02155

April 26, 1977

Ms. Patricia E. Vaughan
Coordinator of the NASIC Program
New England Board of Higher Education
40 Grove Street
Wellesley, MA 02181

Dear Ms. Vaughan:

In response to your letter of April 15, Mrs. Butt reports that, looking back on the two and one half years of our affiliation with NASIC we consider the benefits of affiliation to have been substantial. NASIC has provided assistance in the setting up of our on-line search service with counsel in administrative aspects, involvement in demonstrations and most importantly, training of staff in on-line searching of the various systems and data bases.

Sincerely,

Joseph S. Komidar
University Librarian

JSK:ta

UNIVERSITY OF DELAWARE
NEWARK, DELAWARE
19711

THE UNIVERSITY LIBRARY

April 21, 1977

Ms. Patricia E. Vaughn
Coordinator of the NASIC Program
New England Board of High Education
40 Grove Street
Wellesley, Massachusetts 02181

Dear Ms. Vaughn:

We do have comments on the NASIC program, and I am happy to send them to you.

The NASIC program was definitely a positive factor in the University of Delaware's decision to offer computerized data base searching, and the services provided by NASIC made it possible for us to offer these services earlier than would have been possible otherwise.

All our librarians who went to Wellesley for training by NASIC staff were pleased with the highly professional attitude and approach of the staff. They felt that the training was excellent. Those members of the NASIC staff who came to the University of Delaware for training and demonstration sessions made very good impressions on the faculty and students who met them. The knowledge and enthusiasm that they displayed helped to give our data base searching a good start on what has developed into a steadily growing service.

We left NASIC reluctantly because of financial pressures and because of the distance from Boston for training sessions and meetings, not from any lack of satisfaction. As I have indicated above, we were very pleased with NASIC and wish it every success.

Sincerely yours,

John M. Dawson
Director of Libraries

JMD/mg

The University of New Hampshire Library has been associated with the NASIC program since its inception in 1973, and the program has been extremely helpful in facilitating the introduction of computerized bibliographic searching into the traditional University reference situation. The initial instruction on the Computer by the NASIC staff provided the information specialists with enough training and practice for them to feel competent on the computer. Along with instruction, the NASIC staff helped the information specialists prepare publicity for the program and were available for assistance when the program was demonstrated on the campus.

As a continuing program, NASIC has been instrumental in bringing new services to the attention of its affiliates. The NASIC staff negotiated with the New York Times to make the information bank available to the NASIC institutions. They have also looked into new data base suppliers to make sure the NASIC institutions have access to the best and least expensive sources of computerized search services. They provide opportunities for the information specialists to meet with the data base producers, such as American Psychological Association and Congressional Information Service, to discuss individual data bases and their idiosyncracies. This would be impossible for individual information specialists acting independently. The NASIC program also provides instruction seminars for new information specialists, as well as on-going training for experienced users. This service is essential for information specialists who also perform the traditional role of librarians, usually reference librarians. It is difficult to keep

up-to-date on all the latest developments in the computer world, but the NASIC program helps its affiliates in this essential area.

The University of New Hampshire Library feels that the NASIC program has been of great value in the initiation and continuation of its computerized bibliographic search service.

Donald E. Vincent
University Librarian

University of Pittsburgh
UNIVERSITY OF PITTSBURGH LIBRARIES

April 25, 1977

Patricia E. Vaughan
Coordinator, NASIC Program
New England Board of Higher Education
40 Grove Street
Wellesley, Massachusetts 02181

Dear Ms. Vaughan:

Our involvement with the NASIC organization has been brief but pleasant. The training they provided for the Lockheed data bases was most helpful and useful. I believe one of the reasons for this successful training program was the use of librarians to handle the training. They related well to the librarians taking the training and understand the problems of library patrons, resources, vocabulary, etc.

Sincerely,

Sally L. Rowley

(Mrs.) Sally L. Rowley
Coordinator of Information Services

SLR/mu
cc-Mrs. Rossell

PITTSBURGH, PA. 15260

UNIVERSITY OF RHODE ISLAND
KINGSTON · R. I. 02881

University Library

April 28, 1977

For Pat Vaughan in response to letter of April 15, 1977

The NASIC program incorporated into our Reference Department has enabled us to expand our services for personalized assistance. The production of an instant bibliography for a grant proposal, thesis topic or research project has enhanced our image in the research community and provides a real service to faculty and graduate students.

The NASIC training program has made the development of the needed expertise both exciting and painless for our library faculty. A familiar voice on the line when there is a problem, assistance in public relations and shared concerns at user's conferences have provided invaluable support.

University of Rhode Island

js

116

WOODS HOLE OCEANOGRAPHIC INSTITUTION
Woods Hole, Massachusetts 02543
Phone (617) 548-1400

OFFICE OF THE RESEARCH LIBRARIAN

21 April 1977

RECEIVED

Patricia E. Vaughan
NASIC
New England Board of Higher Education
40 Grove Street
Wellesley, Mass. 02181

Dear Patricia,

Thank you for the opportunity to comment on the NASIC Program.

The NASIC Program has been the most successful experiment in the library and information science field in recent years. It has provided the impetus for major advances in the delivery of information. The members of the NASIC staff provided superior training and encouragement to the academic library community which traditionally lags behind the industrial sector in providing sophisticated information retrieval services. All of us who have participated in the NASIC program have relied on the NASIC staff for guidance and assistance in understanding the new advances in computer-based bibliographic retrieval, and in learning how to organize the service in order to integrate this method with the traditional academic library services.

I hope that the program continues for many years and either expands geographically or serves as the model for other regions. The rapid pace of technological changes in the information retrieval field puts a heavy burden on the ability of the individual librarian to assimilate and apply these changes. We shall continue to need an interpreter and a liaison group such as the NASIC program.

Sincerely,

Carolyn P. Winn

Carolyn P. Winn
Research Librarian

Worcester Consortium for Higher Education, Inc.

Worcester Area Cooperating Libraries

Learning Resources Center
Worcester State College
Worcester, Massachusetts 01602

(617) 754-3964

Ms. Patricia Vaughan
Coordinator of the NASIC Program
Northeast Academic Science
Information Center
New England Board of Higher Education
40 Grove Street
Wellesley, Massachusetts 02181

25 April, 1977

Dear Pat:

The time seems most appropriate to send off a few comments to you about our new search service and the benefits we have received as an affiliate of NASIC.

Worcester On-Line Search was established at the end of 1976 as a project of the Worcester Area Cooperating Libraries, the library arm of the Worcester Consortium for Higher Education. Since mid-January searches have been performed on-site at member institutions for research faculty and graduate students in the natural, applied, and social sciences. The service is also utilized by individuals in the business and industrial communities of the Worcester area.

Our affiliation with NASIC certainly helped us achieve operational status earlier than expected, not only because of the training and workshops immediately available, but also because of the consultation and guidelines provided by the NASIC staff in reaching potential users in our area. I do appreciate being able to draw upon your experience. As long as you have invented the wheel I am free to concentrate on body design and an ignition system.

Without cliches - thank you Pat.

Cordially,

Edyth Dalton